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Ever seen a big glob of Green Slime™ oozing down a kid's face? Then you've seen Nickelodeon® in action. And their business development wizard, Matthew Goldstein (the one wearing pants). His mission is to spread the hip, irreverent, "for kids only" Nickelodeon brand into every new market he can find. From developing Nickelodeon-inspired toys like Green Slime, to spawning international syndication, *Nickelodeon Magazine*, home video and movie deals. That means a lot of meetings for Matthew. A lot of presentations. Naturally he relies on Microsoft® Office to help him put it all together. "Everything is all linked. It's all one. And it just makes life so easy," says Matthew. "It makes an unbelievable difference in my work." We call this phenomenon OfficeLinks. And it means that sharing things like words, numbers and graphics is, well, child's play. Matthew can create an audience demographic chart in Microsoft Excel, then just drag that chart across the screen into his Word report and drop it in. Violà! Instant linkage. Matthew thinks it's incredible. "I love the fact that I can make a link that really works and that's dynamic." And as he works, our exclusive IntelliSense™ technology tracks his progress, then finds ways to make the tougher jobs easier and the easier jobs outright automatic. For instance, Word can correct Matthew's most common typos automatically. It's almost (dare we say?) fun. "Building presentations is 100% easier," Matthew claims. "People at work come in and say, 'What are you using there?' It's amazing. And it's no big deal because it takes no time." So Matthew and his business development presentation, "Nickelodeon 101," are a big smash wherever they go. Just like Microsoft Office. This leading family of business software keeps getting more and more popular. With people like Matthew. And with companies both large and small all over the world. And to make sure it stays that way, we offer the only unlimited support* with no service charge for a product of this kind. So call (800) 240-4782, Department 4GG, for our free Office Information Kit.** With Microsoft Office, you'll see how your business could enjoy a growth spurt of its own.

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Getting on the Internet can be slow, confusing, and expensive. But with everything online from Dow Jones to daily news wires, government and business resources, and after-hours entertainment, can you afford to stay off? Here's our no-nonsense guide to the simplest, cheapest, and fastest ways to get on the Internet.

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yes It runs with NetWare

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PC MAGAZINE EDITORS' CHOICE
Pentium-66 April 12, 1994
DX4-100 June 28, 1994

COMPUTER SHOPPER
Pentium-60 April 1994
Pentium-90 August 1994

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486DX2-66 January 1994, February 1994, March 1994, June 1994, December 1994
DX4-100 October 1994, November 1994, December 1994
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Pentium-66 June 1994, July 1994, August 1994, September 1994
Pentium-90 August 1994, September 1994, October 1994, November 1994

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486DX2-66 March 1994

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486DX2-66	$1545	486DX2-66	$1845	486DX2-66	$2345	486DX2-66	$2745
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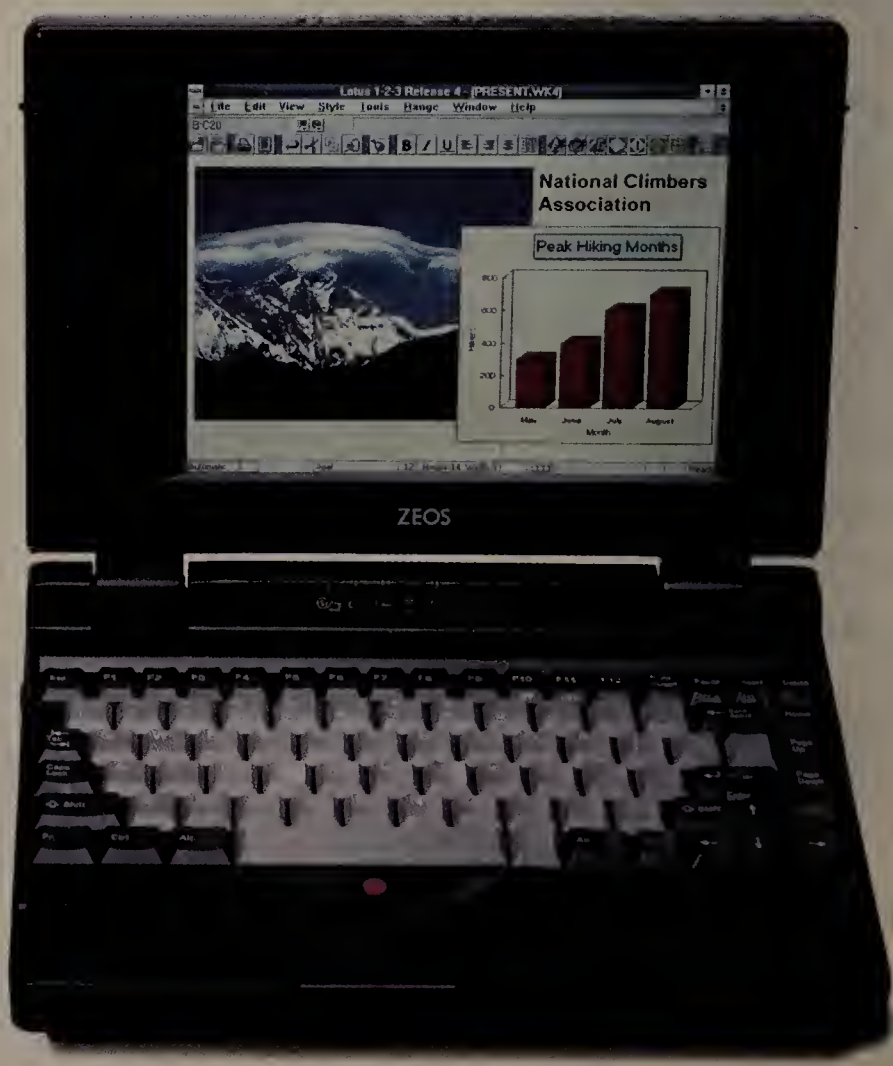

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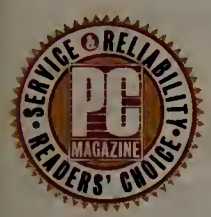

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486DX2-50	$2095	$2395	$2395	$2595	$2695	$2895
DX4-100	$2495	$2795	$2795	$2995	$3095	$3295
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- 15" SVGA color monitor
- 6-bay desktop case
- MS-DOS, Windows for Workgroups, Microsoft Mouse
- Lotus SmartSuite

Pentium-66 $2995
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- MS-DOS, Windows for Workgroups, Microsoft Mouse
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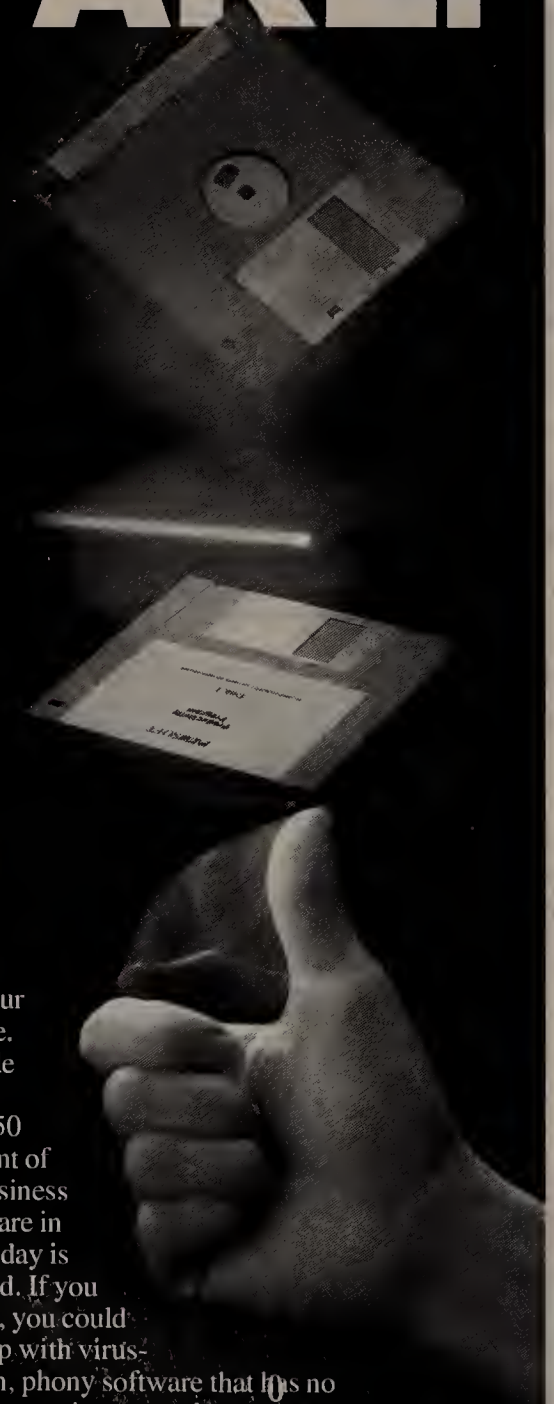

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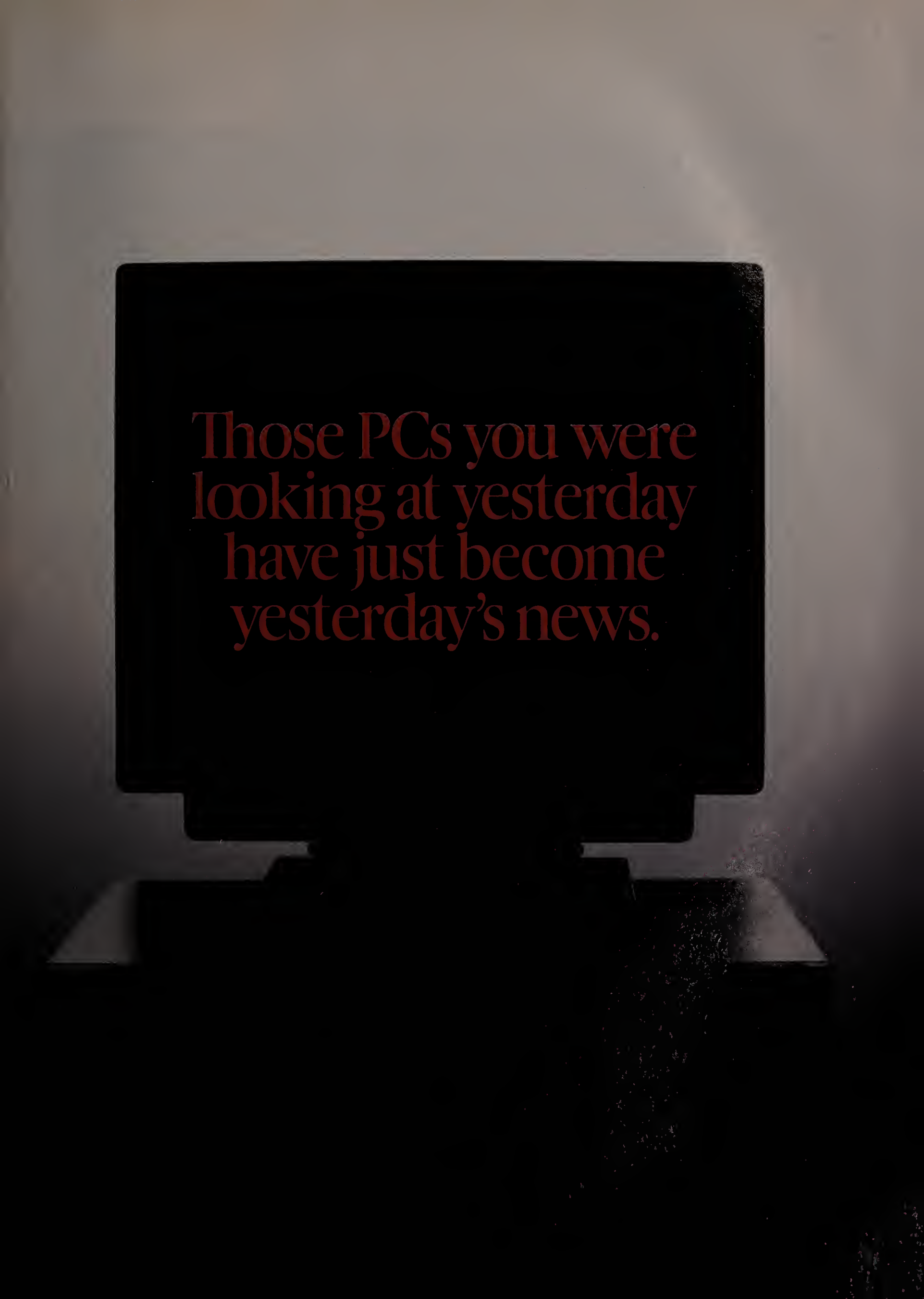
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Taking the Work Out of Workgroup

If you communicate with your colleagues through E-mail for the most part, with multiple cc's and file attachments, you are just wasting your time.

Need to be convinced? At *PC World*, we're addicted to E-mail, and for good reason. We depend on it for fast communication among staff members based across the country. It lets us react instantaneously to last-minute news, announcements, and product rollouts. It's a lifeline when we're traveling and a gateway to thousands of industry contacts nationwide.

But consider the state of my E-mail:
In-box messages: 340, 19 unread
Bulletin board messages: 405, 11 unread
Messages in 138 personal folders: 1560
Messages in 93 archive files: 6579

These compressed archive files take up 22MB of space on my hard disk. Another 15 floppy disks hold messages in deep storage. Multiply all this by the other 39 members of our department, and you get a sense of the magnitude of the problem.

Consider, too, all the files attached to these messages, clogging the network and sometimes slowing traffic to a crawl: 4MB spreadsheets broadcast to, say, seven staff members; eight revisions of a questionnaire in beefy Word files; the latest versions of our budget; article proposals; revisions to manuscripts; revisions to contracts; and so on. Managing this mess is a job in itself.

The crux of the problem? Like many other applications we rely on, E-mail was conceived for communication from one person to another. We're attempting to use it for tasks for which it simply was not designed. There has to be a better way. And that's what workgroup computing is all about: better ways for groups of people to share information, communicate, and collaborate. To accomplish this, existing applications like E-mail must evolve, and new applications must take the dynamics of collaboration into account. The goal should be to reduce the work to be done, rather than to divert our attention from accomplishing tasks to managing files, attachments, and approvals.

Assessing the Software

This issue marks the debut of our quarterly special report on workgroup computing. Edited by Executive Editor Eric Bender and his staff, the section will bring you clear assessments of innovative software aimed at helping workgroups work more efficiently.

This rapidly growing class of software includes document collaboration systems, group schedulers, discussion forums, work-flow packages, electronic whiteboards, video teleconferencing, remote access packages, and more. The bulk of it runs on local and wide area networks and over analog and digital phone lines. Among our readers, 65 percent use networked PCs, so for many of you the infrastructure needed to run workgroup software is already in place, requiring little if any extra equipment.

In the lead article in this month's special report, "Five Great Workgroup Packages That Boost Your Productivity," we examine some of the newest and most promising software. Collabra Share, an adjunct to existing E-mail systems, deals with E-mail glut and meeting overload by enabling workgroups to create in-house online discussion forums, much like those you'll find on CompuServe and America Online. We're about to install Collabra Share in our editorial department in an attempt to bring E-mail under control and cut down on meetings.

Tackling another problem, Ecco Professional 2.0 aims to be a "personal" information manager for the workgroup, handling schedules, maintaining phone books and other contact information, and keeping schedules and files in sync on office, home, and notebook PCs.

A third package is Network Central, which acts as a kind of group File Manager for shared files on your network servers. This software lets you manage shared files and folders, assign access rights, and more, without the need to plumb the mysteries of SYSCON or languish in your IS department's queue.

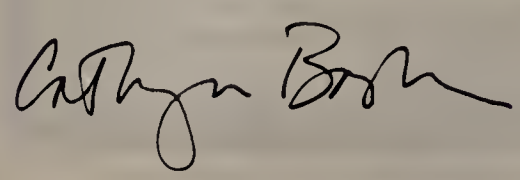
What about Lotus Notes, the premier workgroup package, now with an installed base of 1 million users? The second article in this month's special report examines off-the-shelf applications—from document managers to customer service packages—that let you bypass in-house development and give you a glimpse of the power of Notes.

To reduce our work, existing applications must evolve, and new software must take the dynamics of collaboration into account.

Strength in Workgroups

The potential payoff of workgroup software is enormous: better communication, streamlined procedures, and flattened organizational structures, all of which translate into a stronger, more competitive business. So we'll be on the lookout for software that reduces your group's work rather than adding to it. Watch for reports on Novell's GroupWise, DCA's OpenMind, Crossties for Windows, and more.

Meanwhile, my E-mail beckons.



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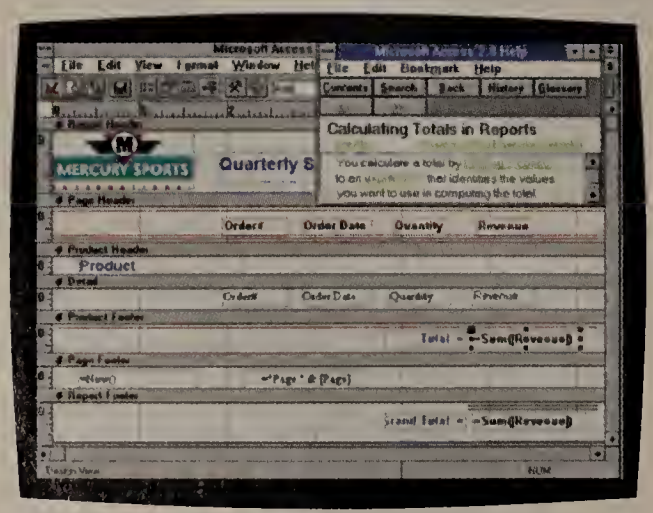

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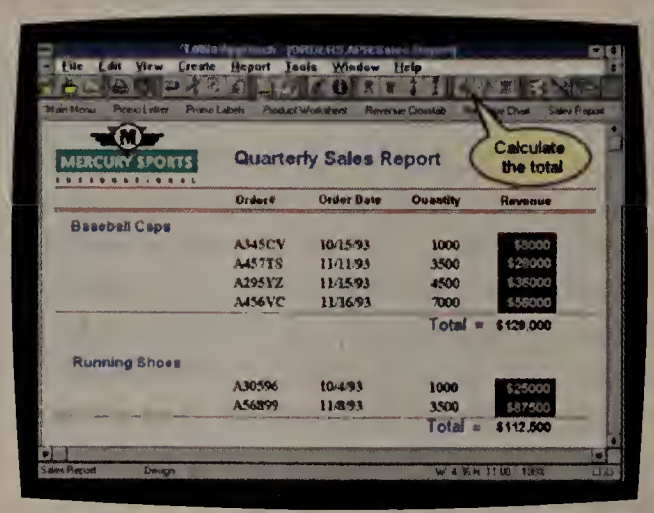

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Pay consultant to change application	*Just do it*
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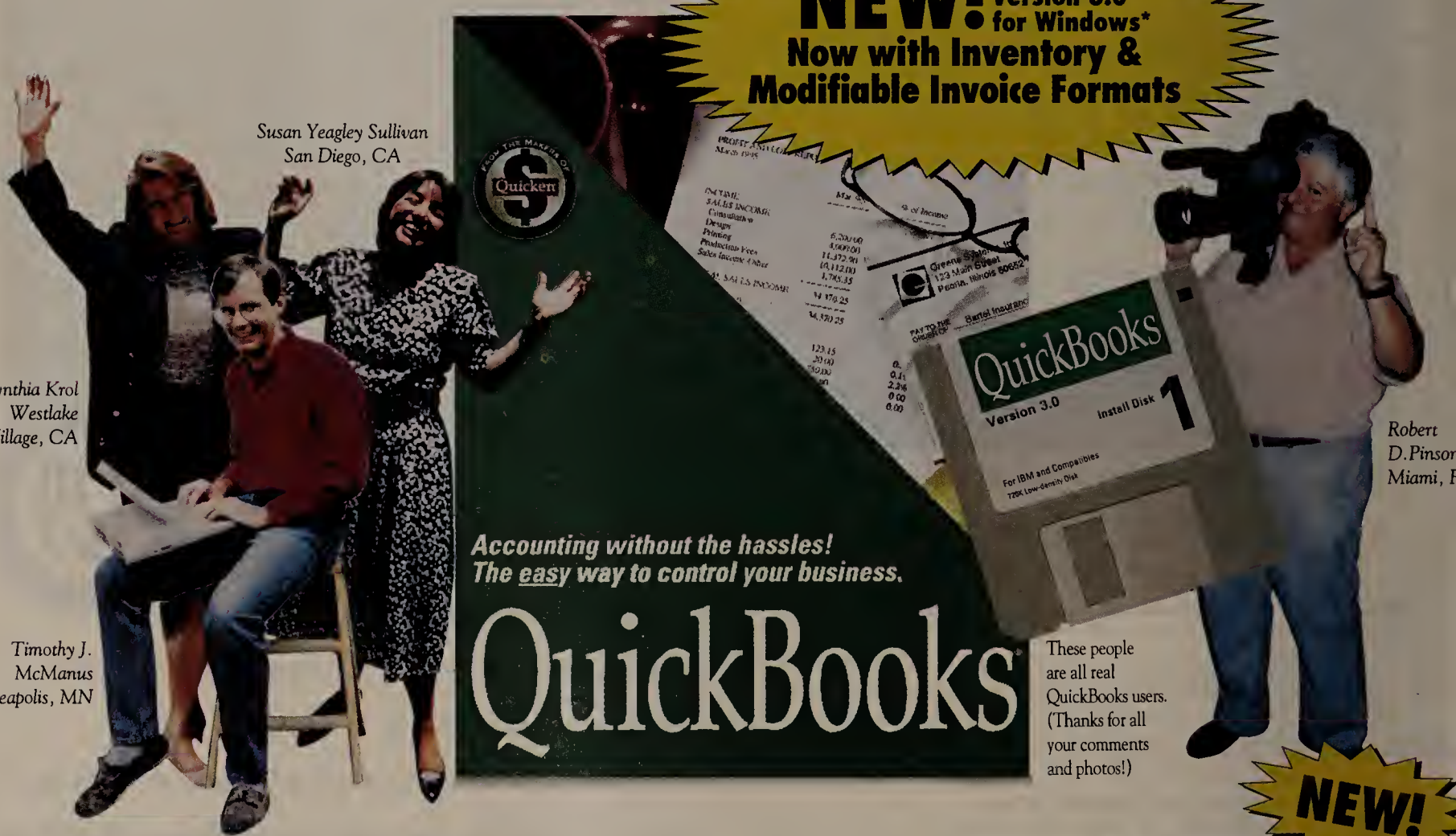

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Redefining Perversity; Operating System Debate Rages On

Watch Your Mouth, PC World

At my workplace, a 286 and three 386s are still on active duty. I was enjoying "Upgrades: When They're Worth It, When They're Not" [November], until I read the snide remark, "If for some perverse reason you run only DOS apps..." If it's perverse to get your work done easily, quickly, and efficiently, I'm guilty as charged. I do have Windows and a few Windows applications, but I use my DOS apps to get things done. I've tried for years to teach my mouse or trackball to type and do spreadsheets for me, with no success. With DOS apps I don't have to worry about "playing mousie"—I just work.

Ross McIntosh, Boulder, Colorado

Protesting a Fumble

I read your October editorial "IBM and Apple Fumble Windows Challenge" [*In This Issue*] over and over, shaking my head each time. While I won't disagree that the IBM and Apple alliance has been a disappointment, OS/2 is a product that can truly compete with Windows and Windows 95. Yet as IBM prepares to release OS/2 Warp 3.0, the press can't stop writing about Windows 95, which hasn't even been released.

The article's last paragraph is perhaps the most damaging to what could have been an objective view of the IBM/Apple alliance. It begins, "Windows 4.0 will soon arrive" (*I ask again, soon?*) "with a friendly user interface" (*one that is a direct copy of OS/2, with some minor tweaking*), "preemptive multitasking, memory protection for each 32-bit application, and backward compatibility with thousands of 16-bit programs" (*which OS/2 has offered for some time*).

I encourage Mr. Lemmons to dig deep into the technical specs of memory and resources management in Windows 95. The path Microsoft is currently on tremendously compromises the meaning of the words "preemptive multitasking" and leaves Windows 95's multitasking ability only slightly better than that now found in Windows 3.1.

The editorial continues, "The introduction of Windows 4.0 is also going to prompt a great rush of 32-bit applications." More likely, a slow trickle of current 16-bit titles "ported" to 32-bit code, leaving the average PC buyer wondering what all the fuss is about.

The column concludes, "By concentrating on fundamentals, Microsoft may well have shut the window on IBM's and Apple's hopes of becoming major operating system providers. Rather than rail at Microsoft, however, we should all be shaking our heads at the failure of these two industry leaders to present developers with a reasonable alternative." If by fundamentals you mean copying Apple's interface and calling it Windows, or copying OS/2's structure and calling it Windows 95, or arranging for vendors to ship products with Windows installed, then yes, Microsoft has stuck to that.

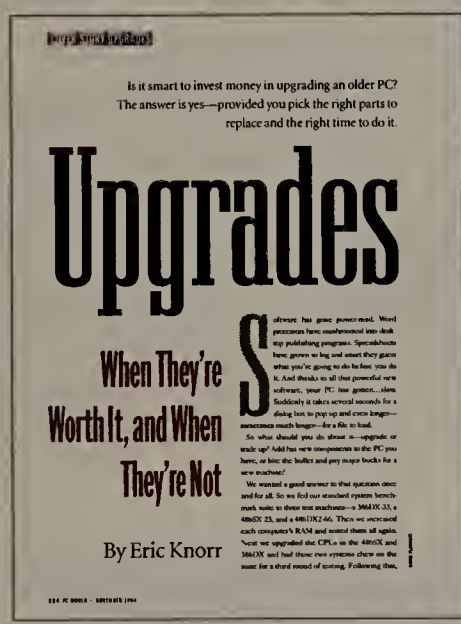
Thanks, but I'd rather rail at Microsoft than at Apple and IBM. Perhaps the last line of the editorial should have been: "Now turn the pages of this month's issue and read all the ads and reviews for Windows products we publish, because, like us, you are doomed to buy them and nothing else."

Michael Patrick, Houston, Texas

Next Challenger

October's "IBM and Apple Fumble Windows Challenge" sounds like another "Microsoft can do no wrong, IBM can do no right" sales pitch.

While it's true the PowerPC will have multiple operating systems fighting for dominance, the Intel platform will have just two major 32-bit OSes—OS/2 and Windows 95. Since OS/2 has sold over 5 million copies in the face of Microsoft's illegal, monopolistic sales practices, it must have something in its favor. What is the big deal about rewriting portions of programs for the Workplace shell, anyway? Upgrades are so frequent that a rewrite is a guaranteed event.



Is it smart to invest money in upgrading an older PC? The answer is yes—provided you pick the right parts to replace and the right time to do it.

Upgrades

When They're Worth It, and When They're Not

By Eric Knorr

I disagree that IBM and Apple miss the point on operating system development. They hit the mark dead center, but Microsoft gets all the attention after it copies aspects of other OSes.

The ones who really miss the point are application developers who refuse to write applications for OS/2 despite the demand from OS/2 users. Their rationalization is that OS/2 users are writing their own code and don't want commercial applications. That may be so for large corporations, but not for all OS/2 users. If developers would write applications and market them as well as Windows applications are marketed, the naysayers might be surprised.

Finally, why will Windows 95 prompt a flood of new apps? Is it because OEMs, afraid to anger Microsoft, will bundle only Windows 95? The sole advantage I see in Windows 95 is its marketing. IBM has the same (possibly better) features now.

DAVID PLUNKERT

As a computer user, I demand a choice. If you are going to blame the anything-but-certain demise of OS/2 and Apple's System 7.5 on someone, put it where it belongs—on developers who criticize Microsoft for its unfair practices but cling to Microsoft OSes out of fear of something new.

Michael Rezsutek, Houston, Texas

Editor's response: The fate of operating systems is decided by the applications written for them. We expect a gush of 32-bit apps for Windows 95 because every software house we ask tells us it's racing to develop for it and has no plans for OS/2 apps. In part, the rush to Windows 95 is defensive: Microsoft's apps are the first to appear for every Windows release, miraculously enabling Microsoft to grab more market share. Now that the Justice Department has blessed Microsoft's use of its operating systems business to feed its applications business, software houses have no choice but to develop for Windows 95 at top speed.

Let's hope someone can reverse the tide of Microsoft dominance and preserve a choice of operating systems. But developers, rational creatures that they are, count the installed base before they target OSes. IBM is trying to win attention by getting OS/2 Warp preloaded. However, Warp is being preloaded along with Windows rather than instead of it. Why? Because buyers overwhelmingly want Windows. Why? Because they want Windows applications. In a market so dominated by Windows, dropping Windows development is suicide.

How can anyone reverse this tide? IBM and Apple between them had the resources to do so. Since their grand alliance in 1991, however, they've decided they prefer hanging separately to hanging together. Now they're talking again, with plans for compatible PowerPC machines by 1996. Allow a year or two for slippage in the schedule, plus confusion caused by multiple operating systems, and we're talking turn of the century before we see a big uniform installed base. Meanwhile, Microsoft is getting better at software development from every standpoint—usability testing, operating system

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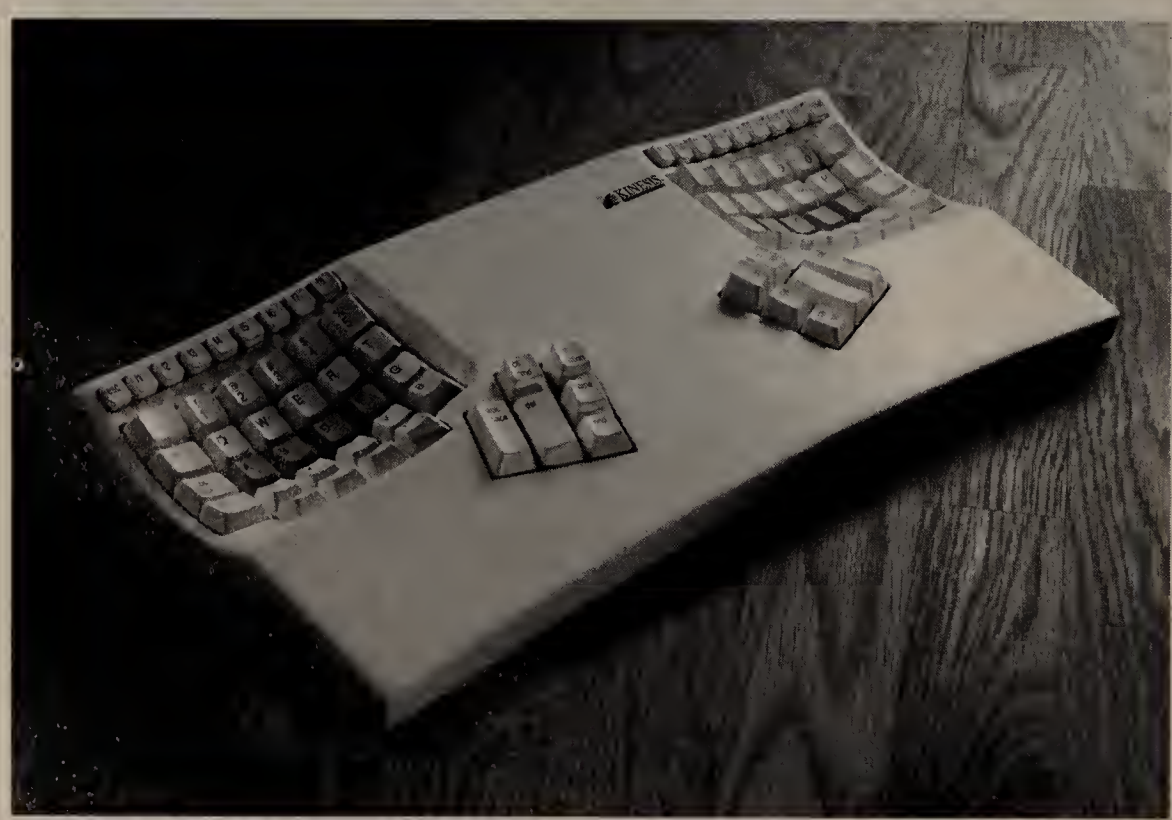

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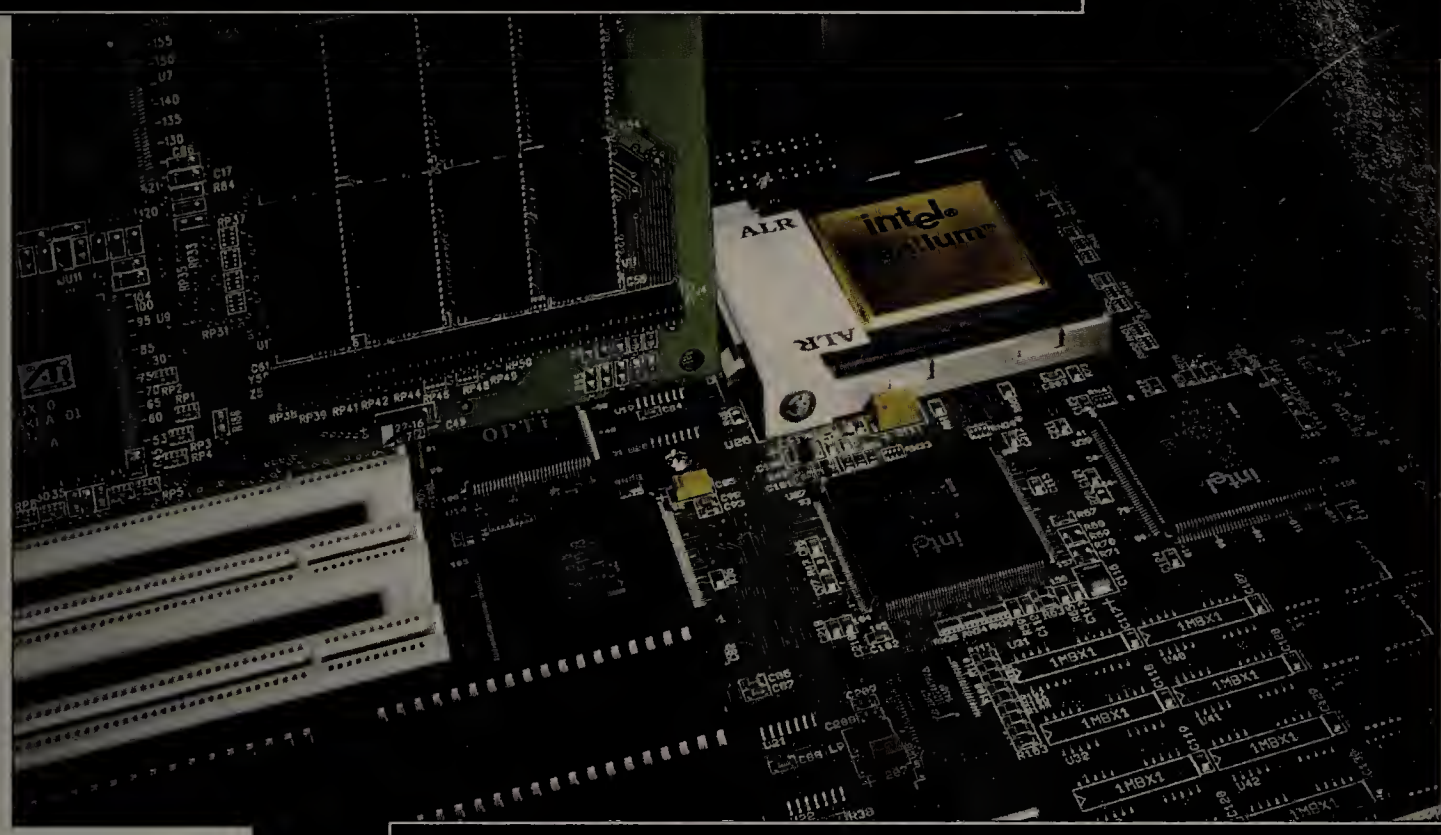

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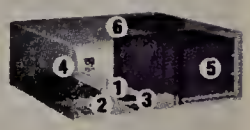

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architecture, management of massive programs, and so on. At some point it makes sense to conclude that Microsoft deserves to win, both because of its own growing competence and the folly of its competitors in systems software. —*Phil Lemmons*

Aladdin Watches Your Pennies

I don't think your review of GEnie for Windows gave the product a fair chance [*New Products*, "GEnie for Windows: Road Kill on the Infobahn," October]. The author should take a look at GEnie through the DOS-based Aladdin interface. After trying Prodigy, AOL, and CompuServe, I am a loyal GEnie subscriber because of its hobby boards and E-mail. Aladdin is the only system that lets me download postings and read them offline at my leisure. Other systems let you read E-mail offline, but browsing boards takes the most time—and money. Through the board, I know people all over the country who share my interests.

Aladdin makes navigation painless. It is programmed with page numbers and keywords, and I don't waste time clicking on cute little icons. It also automatically picks up my E-mail whenever I log on.
Edith Tanniru, Internet

Author's response: I was a dedicated user of GEnie and Aladdin years ago, and I appreciate the sense of community you've discovered there. I found GEnie for Windows couldn't measure up to its more capable opponents, although I didn't realize you can keep your bill so low, even participating in roundtables. —*Joe Abernathy*

Corrections and Clarifications

You can now reach the CPA Computer User Group (*Consumer Watch*, October) c/o Verbit & Company, P.O. Box 181, Bala Cynwyd, PA 19004-0181; 610/668-9840.

The address for Font Source (November *Quick Takes*, page 106) is 117B Chicamauga Ave., Knoxville, TN 37917.

"Is the Floppy Disk Dead?" (*Top of the News*, November) incorrectly stated the configuration of the Swan Instruments FRD disk drive. Instead of an internal hard disk, it uses a second floppy disk capable of storing 88MB or 170MB; the company claims it performs as fast as a hard drive.

Letters *welcomes your responses and ideas* *(see page 12 for contact information).*

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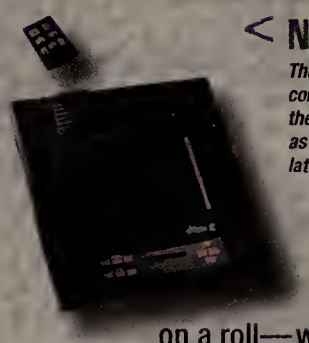

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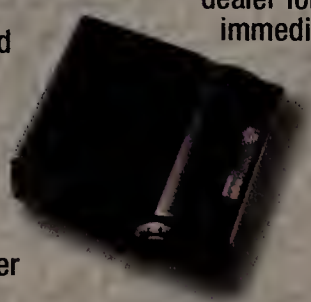

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Copy Protection, the Sequel: Coming to a PC Near You

James Lennane was on a mission: to stop the pirating of his company's software product, the DeScribe word processor for OS/2 and Windows. So with the release of version 5.0 last September, Lennane announced to users that the upgrade disks would expire after six months, rendering the product unusable. Registered users would receive a new copy to install (which would also expire in six months), but anyone using an illegal version would be out of luck.

The move ignited a firestorm among DeScribe users. In a short time, 5 percent of the orders for version 5.0 had been canceled and Lennane expected cancellations to rise quickly to 20 percent of outstanding orders.

It didn't take long before Lennane backed off from his policy of shipping self-destructing disks. "I expected a negative response, but it was more intense than I imagined it would be," says Lennane, adding that he took such an extreme measure to make the point to users—and perhaps to the software industry, too—that it's unacceptable to copy software illegally.

A Billion-Dollar Business

According to the Business Software Alliance, a software industry trade group, $2.3 billion's worth of software was pirated in the United States alone in 1993. The Software Publishers Association, the other software industry trade group, sets the number at $1.3 billion. Whichever figure you choose to believe, it's clear that software copying is alive and well. Both the BSA and the SPA have extensive antipiracy programs in place—with everything from hot lines you can call to report illegal uses of software, to educational programs and software management kits that help businesses make sure they've paid for every copy of software in use.

A handful of software companies are also becoming proactive in their efforts to stop software pirates, employing various measures to make it more difficult—if not impossible—to make or use illegal copies of their software. The approaches include DeScribe's draconian "time bomb" disks, encryption schemes that render all or part of a program unusable until the owner registers with the software company, and creative formatting techniques that make it difficult (though not impossible) to copy the original floppies.

Here are some examples:

• PageMaker 5.0 from Adobe Systems prevents the concurrent use of the same program copy on a network. When a network user tries to load the program, the software checks the serial number against those of other copies in use. If someone else is using one with the same serial number, a second copy won't load.

• The new version of Microsoft Office comes on *1.7MB* floppy disks—a format that can't be copied using any of the standard DOS commands nor through File Manager. As long as the original floppy disks are okay, users won't be inconvenienced. But if you need to reinstall the program and find that one or more of the floppies is damaged, you're out of luck.

• SoftCop, a small software developer in Ontario, Canada, has released a program that enables software companies to lock entire applications until the user calls in, registers the product, and gets a unique code to unlock it. According to SoftCop spokesperson Peter Slocombe, 30 companies are now testing their applications with the software, including three of the ten largest PC software companies (though he would not specify *which* three). He expected the first SoftCop-enabled software to be released in late 1994, but noted that

By Roberta Furger

MICHELE CLEMENT

KEEPING UP

Bridging the education gap: New York City's Non-Profit Computing, an all-volunteer organization that coordinates donations of computers to expand computer literacy, recently established seven new centers for training kids and adults on computers in the New York metropolitan area. Computer donations come from a variety of sources, including companies that are upgrading their hardware. The group has done most of its work in North America, but has set up centers as far away as Mongolia and rural Panama. To contact Non-Profit Computing, call 212/759-2368 or send E-mail to John German at npc@igc.apc.org... Full-service tech support is now available from Compaq via the Internet (support@compaq.com) as well as via America Online, Prodigy, and CompuServe. The support staff answers questions 24 hours a day, 7 days a week, and users can also download drivers, patches, and utilities for Compaq products through a new FTP site (use the address ftp.compaq.com, and then enter anonymous at the user-name prompt and your Internet address at the password prompt)... A nationwide survey of 1001 adults conducted by market researcher Coleman & Associates of Teaneck, New Jersey, shows yuppies are more likely to curse at their computers than older or less affluent users. According to the survey, people ages 19 to 33 with incomes over $50,000 and a college education are more likely to use words they "are not proud of" when talking to their machines.

many companies will wait and include the software in upgrades or new releases.

The SoftCop product has the advantage (from the software company's perspective, that is) of forcing end users to register, which helps software companies develop extensive lists for future marketing efforts.

How Much Is Too Much?

Years ago, much commercially available software was copy-protected. But a customer backlash, and the growing awareness of the laws governing software use, combined to curtail the practice in North America. (Many companies continue to sell copy-protected software overseas, however, where the software piracy is thought to be much more serious.)

No one can argue with a software company's desire—and right—to make sure everyone using their product has paid for it. What is objectionable are efforts that inconvenience all users—not just those using software illegally. For years, developers of game software have included questions in their products that can only be answered with the aid of the accompanying documentation. So to pirate the software, you need to copy the manual along with the floppies. Though that's not an impossible hurdle, it's effectively stopped some of the copying. And legitimate users are largely unaffected. Adobe Systems' approach—preventing multiple uses of a single copy on a network—is also reasonable: Registered users don't have to jump through hoops to use the software, and anyone trying to use it illegally is stopped. Schemes like the one DeScribe attempted to impose, however, and even Microsoft's new disk format for Office, punish the legitimate users right along with the illegal ones.

"Everyone's looking for the silver bullet, but no one's found it yet," says Sandy Bolton, director of Autodesk's antipiracy department. "We routinely find different devices, but until we find one that's transparent, and not a big hassle [to legal users], we won't have a lock."

As for Lennane and the DeScribe users, they've reached a compromise. Before users can receive an unlimited license disk, they must register with DeScribe and sign a continuing license agreement, which states that they understand and agree to comply with the copyright laws governing use of the product. "It's a matter of principle," says Lennane. "I've asked my customers to make a personal commitment before using the software." So far, they seem willing to sign on the bottom line.

Are we in for a resurgence of copy protection schemes? Jeffrey Tarter, editor and publisher of SoftLetter, a monthly newsletter on the software industry, thinks what we've seen so far are isolated instances. "It's a competitive issue. If a company dominates a market, it can push its customers around any way it wants. But in the more competitive markets, I don't think companies will risk economic suicide to nab software pirates."

Unfortunately, with mergers and acquisitions almost as common as new product releases, the software market gets less competitive every day. Let's hope a new era of copy protection isn't the unhappy byproduct of this growing consolidation. ▶

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* WinBench 4.0 and PC Bench 8.0 performance tests done on a Pentium 90MHz, 16MB RAM, 256K cache, 420 MB HD, using 2MB and 4MB PCI graphics cards. WinBench 4.0 at 1024x768/256 colors (large fonts) and 800x600 in 16.7M colors (small fonts) at 70Hz refresh rate.
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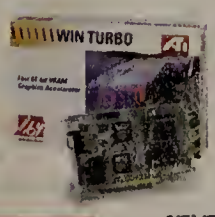

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No Parts for Out-of-Warranty PC

My company has had difficulty obtaining adequate support on a computer purchased from Zeos. Just over a year ago we bought a 486 for use as an AutoCAD workstation. A month after the warranty expired, the cache failed, preventing us from using any of our AutoCAD applications. When we contacted Zeos, we were told the cache board manufacturer had gone out of business. Since the PC is out of warranty, Zeos told us it is not obligated to supply parts.
Jeffrey Berk, Dublin, Ohio

Editor's note: According to Zeos, Berk's computer model was discontinued one month after he bought it. Since the time Berk contacted them, Zeos has manufactured ten cache boards for customers in Berk's situation and has offered to sell them for $198 each ($100 higher than usual because of the limited quantity produced).

Rick Apple, a spokesperson for Zeos, noted that if the company had not manufactured the cache boards, Berk's alternative would have been to purchase a new motherboard, power supply, and case for $490 and a new cache board for $98. While Zeos has no official guarantee on how long it will stock parts for a machine, Apple told us the company finds a solution to most problems.

In this fast-moving industry it's hard to protect yourself against being caught with hardware that can't be replaced. But you *can* take a few precautions: When you buy your computer, ask if it has standard industry parts and not proprietary ones. And ask how long the company guarantees availability of replacement parts—though this won't guarantee the price will be reasonable.

The Technology Disappoints

My work involves reviewing and editing documents, so I was intrigued by the promise that OCR (optical character recognition) could produce editable documents from faxes I receive on my fax board. So I upgraded from Delrina's WinFax 2.0 to WinFax Pro 3.0 to get this feature.

My attempts to use OCR resulted in documents so garbled they were editable only insofar as I could edit them with my word processor—but it would have been much faster to just retype the fax.

I called technical support and sent some samples of my results to the technician. The response I got floored me. Not only were my results typical, they were superior to what Delrina expected from the OCR system included in WinFax Pro 3.0.
Donald Hirsch, Lakeland, Florida

Editor's note: We contacted Delrina, and a representative said the newer WinFax 4.0 uses the Xerox TextBridge OCR engine, which the company claims is faster and more accurate. Delrina sent the 4.0 upgrade to Hirsch, who reports that the new version worked beautifully and he got 90 to 95 percent accuracy, even on poor-quality faxes.

Shop Talk *is written and researched by* PC World *associate editor Christina Wood with research assistance from Peggy Nauts. Think you've gotten a raw deal—or a great one?* Consumer Watch *wants to hear the details. We'll investigate complaints and publish letters with the broadest interest. See page 12 for contact information.*

Consumer Watch continues on page 40

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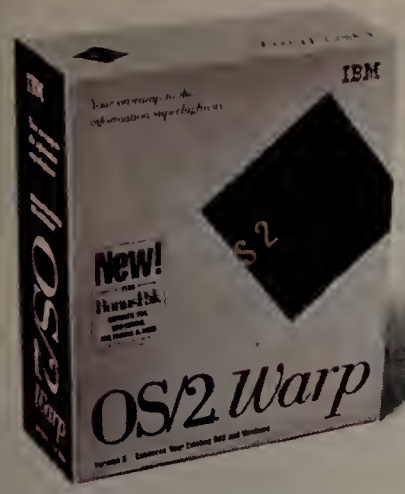

On a typical day, stockbroker Bret Williams makes his personal computer do some very atypical things.

He imports live market data off the ticker at the same time that he's reading the stock page on-line, at the same time that his computer is firing off e-mail to a client, and at the same time that it's faxing his lunch order (pizza, usually).

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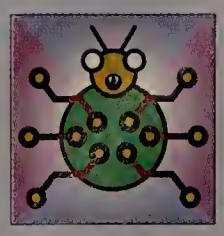
BUG WATCH



Peachtree Accounting 3.0 for Windows

Reported problems include incompatibilities with Windows for Workgroups' VSHARE and Windows NT, incorrect inventory value balances, incorrect general ledger balances after editing and reposting invoices, and very slow balance recalculation, with no option to turn it off.

An October 1994 fix (called batch 03) resolved many of these problems, and a later interim release, which should be available now, will tackle remaining bugs. To receive these updates, you can send E-mail to Peachtree Software at CompuServe (71333,2420), or post a message to one of the company's forums on CompuServe (GO WINPEACH), America Online (Peachtree), or Prodigy (Financial Software, PC Bulletin Board). You can also fax your request to Peachtree at 404/564-5880.

Windows for Workgroups 3.11

Microsoft reports several incompatibilities between Windows for Workgroups 3.11's 32-bit File Access feature and third-party disk compression programs and network drivers.

If you use Stac Electronics' Stacker 3.1 disk compression utility with 32-bit File Access enabled, when you use the File Info and Disk Info commands you may get an error message telling you Stacker is not installed. Stacker still works, but to use the utilities, turn off 32-bit File Access in the Virtual Memory dialog box of Control Panel's 386 Enhanced applet.

Stacker 4.0 is incompatible with Windows for Workgroups' 32-bit File Access on any compressed drive until you download the patch file S4UP.EXE from CompuServe (GO STAC) or from the Stac Electronics BBS. Or you can call the company's customer support line to get the fix on a disk.

If you are running Windows for Workgroups 3.11 with the MSIPX Novell network driver (a version 3.1 carryover that was discontinued), you may experience delays when starting applications in Windows. The slowdowns occur only if you have 32-bit File Access enabled on a hard disk drive controlled by Windows' real mode mapper (RMM.D32), or on drives that use disk compression. To fix the problem, switch from MSIPX to the Novell ODI drivers included with Windows for Workgroups 3.11, or simply turn off 32-bit File Access.

You can reach Stac Electronics customer service at 800/522-7822 or BBS number 619/431-5956, and Microsoft Product Download Service at 206/936-6375.

—Scott Spanbauer

Have you run into a software bug or hardware incompatibility? Call us at 415/978-3253 with details. We'll investigate problems and report on those with the broadest interest. Due to the volume of queries, we may not be able to return your call, and we can't provide technical support.

Scott Spanbauer is a contributing editor for PC World.

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Life in the Software Maze

Just about every manager faces the same problem: How do you avoid frittering valuable time away on niggling, time-consuming tasks so you can focus your attention on the big picture?

For people who buy off-the-shelf PC software for their company or workgroup, the little things can get out of control. Keeping track of corporate standards and policies, evaluating upgrades, and sorting out complex contracts from myriad vendors can bog you down in endless details. Even if buying software is a small part of your job, the process can eat into your productivity. This month, Sherie Roberts, a senior buyer at the U.S. headquarters of Boehringer Ingelheim Pharmaceuticals in Ridgefield, Connecticut, describes how a new electronic procurement system eased enormous software-buying headaches.

The Discount Dilemma

As any office manager knows, even ordering a box of pencils can be a problem sometimes. It's hard to figure out which brand you want; it's tougher to find the best deals. Then you've got the forms to fill out, approvals to route, and purchase orders to issue.

Magnify this problem about 1000 times, and you have a sense of my job. As a senior buyer for a 24,000-employee international corporation based in Ingelheim, Germany, I'm responsible for purchasing all computer equipment and supplies for the 1200 PC users in our U.S. headquarters, as well as handling major contract negotiations and agreements with computer hardware and software suppliers. I also act as liaison between software vendors and our corporate information systems department.

As with most corporations, my company's IS department, which oversees our computers, wants to avoid having to support hundreds of different packages for a thousand users. To minimize the support burden, my company has established strict standards for software purchases. We've standardized on Microsoft packages such as Word for Windows, PowerPoint, and Excel; anybody who wants a nonstandard application must first make a strong business case for it.

Though the standards make it easier to buy and support software for our many employees, the process is still complicated. Before I can order a new software package, an employee needs to fill out a purchase order requisition form and get all the necessary approvals. I then look up a part number and price and send the order to our reseller, who works with the vendor to get the software to us.

The internal hurdles are nothing, however, compared with those presented by the software vendors. There are thousands of packages, each with its own licensing, pricing, contractual, and other issues to be negotiated—not only for the entire corporate purchase but often on a *per-package* basis.

A Mixed Blessing

Consider the mixed blessing of a software-buying program like Microsoft Select, which offers discounts to corporate buyers. Last year Microsoft extended a special licensing agreement that promised to save corporate buyers a lot of money. In the past, Microsoft (like many software companies) required us to purchase shrink-wrapped software complete with disks and manuals for every user. Under the new agreement, Microsoft licensed us to make copies of its software but didn't require us to pay for extra documentation and disks. Considering that we sometimes purchase software for 1200 users at one time, that sounded like a good deal.

Sherie Roberts of Boehringer Ingelheim Pharmaceuticals

The catch lay in trying to decipher Microsoft's discount methodology. We received points for each package that we ordered—say, one point for a copy of Word and two points for the Microsoft Office bundle. The products came in various flavors, each with a separate part number. We could acquire a license only, or a license and a disk, or a license and documentation but no disk, or the full shrink-wrapped package. Each product also belonged to a group with its own set of point criteria; if we ordered a suite, we had to figure out the number of points for all the products in it. On top of that, there was a separate set of criteria for larger discounts. The contract also had to address the needs of other North American Boehringer Ingelheim companies as well as take into account an international Microsoft agreement. I felt lost in a giant maze.

About the time we embarked on the Microsoft Select program, in partner-

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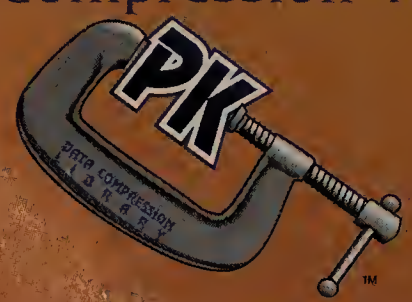

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ship with our IS department, we issued a request for proposals to choose a single software reseller that could better navigate the Microsoft Select program for us. The reseller we chose—Corporate Software of Norwood, Massachusetts—had introduced a new way of working with its Fortune 1000 customers: a free electronic ordering system called Corporate Connection. By installing its Windows-based software on my PC and then using my modem to dial into its online catalog, I found a way out out of the maze.

Today I use Corporate Connection to do all our corporate software purchasing online. I can look up part numbers and prices for more than 7000 software packages. Ordering takes just a few mouse clicks, and there's no minimum order. I receive immediate confirmation for each item ordered as well as expected ship dates.

Although Corporate Connection can't help me negotiate the details of a contract, it makes it easier for me to see if a package is sold with media and documentation. So figuring out the point system is simpler.

By ordering software electronically, I avoid the endless game of telephone tag to track down part numbers and prices. Instead of writing purchase orders, printing them out, and faxing them off, I save an estimated 750 hours a year by ordering electronically. I keep track of special pricing myself and don't have to rely on my reseller to tell me about discounts. Finally, Corporate Connection keeps a record of my order history so I can plan future purchases.

My company is exploring the possibility of trading our paper-based purchasing systems for an electronic forms routing system. And while the Corporate Connection program is still in its infancy, Corporate Software is planning to expand it to a completely electronic system for order management, distribution, online tech support, and E-mail. We may link our entire software purchasing process with this system, so we can eventually "go paperless." In the meantime, I'm just glad to be able to concentrate on more important aspects of my job.

Edited by Bronwyn Fryer

Bronwyn Fryer is a contributing editor for PC World. *If you use PCs to manage people and other resources in a business environment, we want to hear from you (see page 12 for contact information).*

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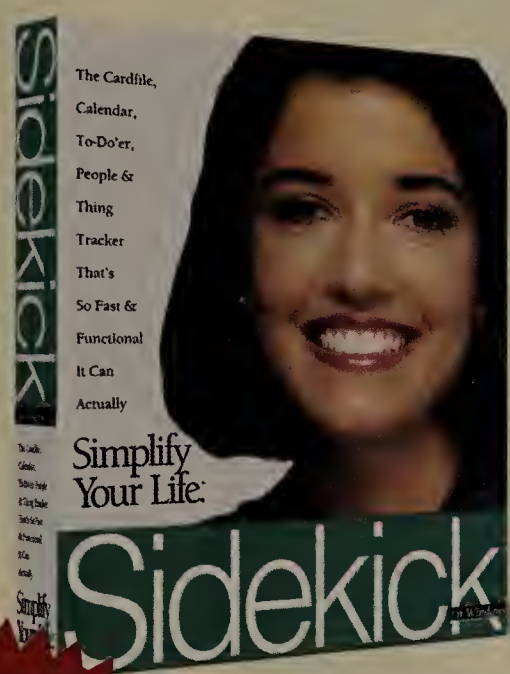

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Windows Tips

50 Tips, Tricks, and Shortcuts Including Everything You Always Wanted to Know about Windows*

*but were afraid to ask

FROM THE EDITORS OF PC WORLD

Introduction

NEED TO STREAMLINE YOUR WINDOWS WORK? READ ON! THIS collection of the 50 best Windows tips ever published in *PC World* is guaranteed to make your Windows computing easier and quicker. Gathered from *PC World* editors, savvy readers, and industry experts, these tips include innovative, little known, and often undocumented ways to harness all the power of Windows. Shortcuts for moving and copying files, organizing your desktop for fast access to icons, cutting and pasting between Windows and DOS applications, managing memory more efficiently, speeding up sluggish printing—they're all here in one handy reference guide.

Whether you're just learning the ins and outs of Windows or think you've mastered the basics, check out "Everything You Always Wanted to Know about Windows...But Were Afraid to Ask." Ten tips sum up the fastest ways to perform basic Windows tasks—a quick refresher course that'll make you more productive instantly.

Shane Rau, Assistant Technical Editor, PC World

Contents

2 "Everything You Always Wanted to Know about Windows... But Were Afraid to Ask"
2 Starting Smart
5 Making Fast Moves
6 Working in File Manager
7 Printing in Windows
9 Customizing Windows
11 Using Windows Tools
14 Doing DOS in Windows

Starting Smart

1. Load Windows Smart

Microsoft gives you lots of doodads that make *Windows* fun—wallpaper, patterns, and so on. But loading these images at start-up takes time. To get up and running in a thrice, strip *Windows* of its wallpaper: Double-click the Desktop icon in the Control Panel, select *(None)* for both Pattern Name and Wallpaper File, and click *OK*. —*Robert Luhn*

2. Optimizing Program Manager

One of the more frustrating problems with *Windows'* Program Manager is that you can waste too much time playing Find the Icon. The best way to avoid this is to create an organized—and permanent—desktop. Here's one way to do it.

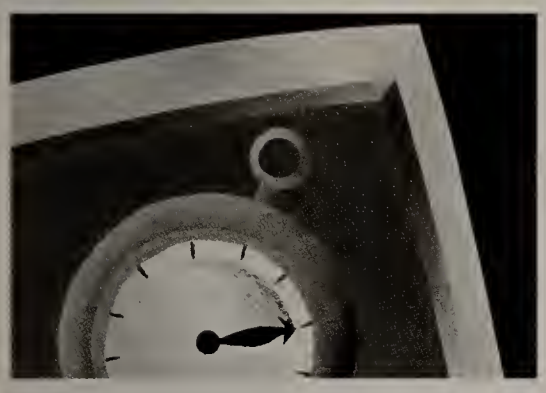
In Program Manager, make sure that Options•Auto Arrange is checked and Options•Save Settings on Exit is not. Then fire up the Control Panel and double-click the Desktop icon. In the dialog box's Icons section, reduce the Spacing between icons as much as you can without overlapping the program item titles—say, to 48 pixels—and make sure the Wrap Title box is checked. (You may have to experiment a bit to find the right setting.) Select *OK*, then close the Control Panel.

Now, minimize all Program Manager groups to align them along the bottom of the screen. Double-click the group icon that contains the applications you use most, then drag it to the top of the screen and size it as a horizontal box, just high enough to hold a single row of icons and descriptions. Select each icon that has a two-line description, then select *File•Properties* (or press **<Alt>-<Enter>**) and shorten the text in the Description field (for example, you can change 'ATM Control Panel' to 'ATM').

Everything You Always Wanted to Know About Windows*

You probably know the following ten tips already, but just to be on the safe side, glance over them. they could save you a lot of time.

1. Hold down the **<Alt>** key and press **<Tab>** to cycle through your open applications. Use **<Alt>-<Shift>-<Tab>** to cycle backward.
2. Double-click on the title bar (rather than the Maximized or Restore buttons) to toggle an app between full screen and windowed. It's bigger and easier to select.
3. Double-click on your wallpaper or desktop background (or press **<Ctrl>-<Esc>**) to bring up Task Manager.
4. Drag a file from File Manager into a Program Manager group to instantly create an icon for it.
5. You can assign a keyboard hot key to any Program Manager icon. Click once on the icon and press **<Alt>-<Enter>** to bring up the Properties dialog box, click in the Shortcut Key text box, and type the letter, number, or function key you want to use.
6. It's easy to use the mouse to select



Finally, expand the group window until the scroll bars disappear, and leave room for new programs you may add later. Repeat the process for the remaining program groups, positioning them so their borders just touch.

The key here is to avoid overloading your program groups with more icons than can fit in a single row. If your groups are bursting with apps and file icons, you may want to split some off into separate groups. Select *File•New•Program Group*, type in the name of the new group window and group file, then drag the icons into the open window. Put programs you rarely use into their own group, then minimize the group icon and drag it to a visible but remote spot in the Program Manager window. Once you're satisfied with your arrangement, hold down **<Shift>** while you press **<Alt>-<F4>**. From now on, your well-organized desktop will remain unchanged and will appear the same way each time you start *Windows.* —*George Campbell*

3. Open Files Automatically

Need to open the same file every morning when you begin working? Most applications will accept a file name as an "argument" following its executable file's name, letting you launch the application with the file already loaded.

To set up this arrangement, switch to the Program Manager, click once on the application's icon, and press **<Alt>-<Enter>** or select *File• Properties* from the drop-down menus. Then in *Program Item Properties*, go to the Command Line field and type a space after the executable file name (such as WINWORD.EXE), followed by the data file's drive, path, and name. Click

menus and menu options in Windows, but using the keyboard is faster. Use **<Alt>** to activate the menu bar, press the underlined letter in the menu's name, then press the underlined letter of the option you want (for instance, <Alt>FX selects File • Exit to exit an application).

7. You can print a document file from File Manager by dragging a file into Print Manager, even if Print Manager is minimized. The only catch is that the file has to have a TXT extension or another extension associated with a program on your system.

8. You can move Program Manager icons from group to group by dragging and dropping them with the mouse, even if the destination group is minimized.

9. You can copy Program Manager icons (instead of moving them) by holding down the **<Ctrl>** key while you drag and drop.

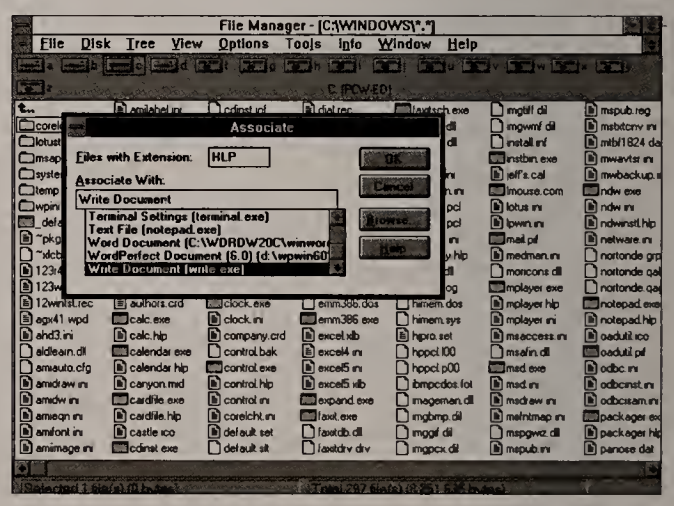
10. When selecting files in File Manager, hold down the **<Shift>** key to select a contiguous list of files or **<Ctrl>**-click to select files that are not next to each other.

OK. If the file is in your working directory, just supply the file name.

The same rules apply to menu items and macros. With applications like *Word for Windows*, you can add the function or macro that performs this task to the application's Command Line. For example, to issue the File•Open command when you load *Word for Windows*, add **/mFileOpen** after WINWORD.EXE in the Command Line text box, and click *OK*. —*R. L.*

4. Launch by Association

Windows 3.1 gives you more than one way to jump-start your applications. You can also launch and load data files from inside File Manager—just associate the data file's extension with the name of the application. Here's how: Simply launch File Manager, choose *File•Associate*, and in the Associate dialog box that appears, type the data file extension. Then choose the appropriate application document type in the Associate With list (if the application is not listed there, use *Browse* to locate it on your hard drive) and click *OK*. Next time you want to load a file in a hurry, just double-click on it from one of File Manager's lists. —*Scott Spanbauer*



ASSOCIATE DATA FILES AND APPLICATIONS with Windows 3.1's File Manager: When you click the file's icon in File Manager, Windows will launch the application and load the file.

5. Quick Reference

Do you have certain text that you refer to often? Save it, in whatever word processor or spreadsheet program you use, as an ASCII text file with a TXT extension. Put that file in your WINDOWS directory or a directory in your PATH statement. That way you can bring up the file by selecting *File•Run* in File Manager or Program Manager or by going to the command prompt in any Windows utility with such a prompt, and typing the file name. —*Lincoln Spector*

6. Templates of the Gods

In addition to files and menu commands, many apps will also load templates along with a program. Do you spend most of your day composing business correspondence? Simply add the name of a template such as LETTER.DOT to the Command Line in your word processor's Program Item Properties box and it'll start up with that template ready to go. If you use several templates, you'd do well to create separate icons for each one,

then launch the appropriate version of your application from Program Manager. —*Steve Fox*

Making Fast Moves

7. Assign a Hot Key to Program Manager

A hot key is the fastest route back to Program Manager, but creating one takes a little ingenuity. First, launch File Manager in a partial window so that Program Manager is visible behind it. Click on the name of the directory where *Windows* is stored, and find PROGMAN.EXE. Select the file with the mouse, and drag it to your StartUp group in Program Manager. With the new Progman icon still highlighted, select *File•Properties* (or press **<Alt>-<Enter>**) and, in the Program Item Properties dialog box, assign a shortcut key. Now you'll be able to get to Program Manager in a snap, without having to waste time cycling through all your other active programs. —*S. S.*

8. Skip Around the Window

Tired of clicking your mouse to select program icons? Windows has keyboard equivalents for *everything*, and using them is often faster. In a Program Manager group, for example, select a program by typing the first letter of the icon's name. Want to jump to the Cardfile icon in your Accessories group? Just move to the Accessories group and press **C** until Cardfile's icon is selected. (Each key press moves you to the next most recently selected icon that has a description beginning with *C*.) Press **<Enter>**, and the program will launch. Easy, quick, and simple to remember. —*R. L.*

9. Turbocharge Your Cursor and Mouse

Although *Windows* can be pretty sluggish in general, you can boost the mouse and keyboard with a few quick Control Panel settings. Double-click the Mouse icon, configure Mouse Tracking Speed and Double Click Speed to a faster setting, and click *OK*. Double-click the Keyboard icon, move the Delay Before First Repeat slider bar toward the "short" end of the scale and the Repeat Rate to a faster setting, and click *OK*. Now your mouse and cursor will roar across the screen, zip through menus and text, and perform operations more speedily. Just don't set these options too fast, or you might find it difficult to double-elick items. An added bonus: If you exit *Windows* and load a DOS program, the faster keyboard settings will be passed along, speeding up your DOS program as well. —*R. L.*

10. Quick Picks in List Boxes

Why scroll down lists when you can jump? By typing the first letter of an item in a list, you can move directly to that area of the list box. The key is to

make sure the list box you want is active. For example, to activate the file-name list in a Browse box, simply **<Tab>** over to the list box (or click inside it with the mouse). Type the first letter of the file name, and the list instantly shifts to show all files beginning with that letter. Type that same first letter to move down the list. —*Kay Yarborough Nelson*

11. Beyond the Keyboard

Windows lets you use hundreds of accented characters, special symbols, and punctuation characters to polish your documents. To access these characters, you can go to Character Map, but that's cumbersome. Especially when all you have to do is hold down **<Alt>** while typing a four-digit code on the numeric keypad. The figure at left shows the codes for some characters in the TrueType fonts Arial, Times Roman, and New Courier. If the character you need isn't there, run Character Map, select your font in the Font drop-down box, and click or cursor to the character you need. A message in the lower right of the dialog box will tell you the character's key code. —*Michael Desmond*

Symbol	Code
½	0189
¼	0188
©	0169
¥	0165
"	0147
"	0148
–	0151
è	0232
é	0233

SPECIAL <ALT>-KEY character codes

Working in File Manager

12. Setting the Stage for Drag and Drop

It's handy to drag files—whether data or executable—from File Manager into Program Manager to create a program icon. It can be tricky, though, to get both File Manager and Program Manager properly arranged on the screen. To make it easy, click (in File Manager) on the file you want to drag; press **<Ctrl>-<Esc>** to bring up the Task List dialog box; and click the *Tile* button, which will arrange all your open, unminimized applications in nonoverlapping windows. Now it's easy to drag the file into any Program Manager group. —*R. L.*

13. Instant Tree Collapsing

When you're in File Manager, you can collapse a whole tree display with just a couple of keystrokes. Press **<Home>** to go to the root directory, and type a minus sign (-). To redisplay your entire directory structure in the directory tree window, type an asterisk (*). —*K. Y. N.*

14. Directories Be Gone

Need to lop off a branch of your directory tree and all its files and subdirectories in one blow? You can't do it from DOSSHELL or the DOS prompt—but you can with File Manager. Here's how:

Start File Manager, then choose your drive and select the top level of the directory tree you want to delete.

Now select *File•Delete*. In the next dialog box, ensure that the directory name is the one you want to kill, then select *OK*. You'll see another dialog box and have another opportunity to abort the deletions. If you're sure, select *Yes to All*. Depending on the file structure, you may have to select *Yes to All* once or twice more. —*G. C.*

15. Put a Gag on File Manager

If you do a lot of file maintenance—deleting, moving, and copying—you're probably sick of File Manager insulting you with those condescending 'Confirm File Delete' messages even after you've looked at the file name and clicked OK. Here's a way to squelch File Manager's nervous whining. From File Manager, select *Options•Confirmation*. Uncheck the File Delete, Directory Delete, and File Replace check boxes (or any combination of these that suits you). Click *OK*. If you don't want to be harassed every time you drag a file between directories, uncheck the Mouse Action box. Now when you delete or move files and directories, File Manager will just do it. —*Daniel Tynan*

WINDOWS 3.1'S FILE MANAGER lets you lop off full directories in a single blow—but gives you a chance to reconsider.

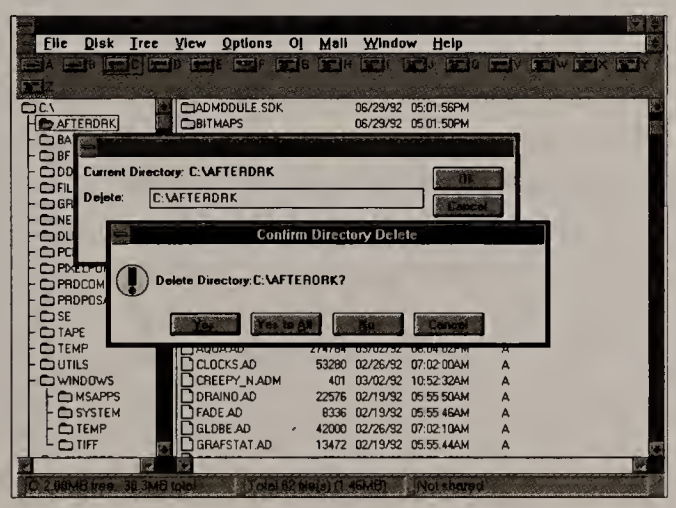
16. Where's Undelete in File Manager?

If you chose to install the Windows versions of Anti-Virus, Backup, and Undelete, DOS 6.0 creates a new Windows Program Group, called Microsoft Tools, and installs the three appropriate icons. Equally handy, DOS adds a menu item called Tools to File Manager so you can initiate Anti-Virus and Backup. But what happened to Undelete? It's there too, but you'll find it under the File menu. If you're running Windows for Workgroups, DOS goes one better, installing icons for all three utilities in File Manager's tool bar. —*S. F.*

Printing in Windows

17. Avoid Print Managers Slowdowns

When an app sends data for printing, Print Manager creates a temporary file that can be several megabytes in size.



If there's not enough room on your disk, your system can slow to a crawl or refuse to print.

First make sure the line **SET TEMP=C:\TEMP** (or another directory on your hard disk) is in AUTOEXEC-.BAT. This command sends all temporary files to the specified directory. To speed print spooling, the path should be on a drive with at least 6MB free. Don't send temp files to a RAM disk. It's better to keep RAM free for other *Windows* functions. —*G. C.*

18. Real Virtual Memory

Does your PostScript printer lag when churning out pages with downloaded fonts? Don't curse Adobe—the culprit may be the virtual printer memory setting. *Windows* uses this setting to estimate how many fonts it can download. When the setting shows less virtual memory than your printer has, *Windows* wastes time flushing fonts to reload others before it needs to.

To print a report showing your printer's virtual memory capacity, change to the directory containing the file TESTPS.TXT (usually C:\WINDOWS\SYSTEM). Then type **COPY TESTPS.TXT LPT***n* (where *n* is the number of the port connected to your PostScript printer). To increase the virtual memory setting, open the Control Panel and double-click the Printers icon. Highlight the name of your printer and select *Setup•Options•Advanced*, then type the correct amount in the Virtual Memory dialog box. —*Bob Weibel*

19. Print Directly to Port

Bypassing DOS by printing directly to your printer port can boost print performance. Simply open Printers in *Windows'* Control Panel, select the printer from the list, select *Connect*, check the Fast Printing Direct to Port box, and select *OK*. Your printouts will arrive a tad faster. —*Robert J. Lauriston*

20. Print Directly to Network Queue

If you're on a NetWare LAN, you can print directly to a network print queue, bypassing DOS and NetWare's CAPTURE utility to improve performance. Open Printers in *Windows'* Control Panel, select the printer from the list, select *Connect•Network*, and select the queue from the list. (If no queues are visible, select *Attach*. In the next dialog box, choose your server from the drop-down list, input your user name and password, and click *OK*.) Then select your print queue and *Connect•OK•Close•OK*. —*R. J. L.*

21. Faster Font Printing

For the fastest output, stick to an internal printer font, such as the HP LaserJet's built-in Courier. If that's not practical, pick TrueType fonts. For example, TrueType's Arial font prints about three times faster than *Adobe Type Manager*'s Helvetica. To tell which fonts are which, run *Windows* Write, select *Character•Fonts*, and look at the Font menu. Most printer fonts have a printer icon next to them; TrueType fonts have a double *T*. —*G. C.*

Customizing Windows

22. Personalized Program Manager

If you really want to feel comfortable in Windows, put your personal touch on Program Manager. First, from File Manager, select *progman.exe* in your WINDOWS directory and drag it into your StartUp group in Program Manager to create an icon. Click once on the new icon, select *File•Properties* (or press **<Alt>-<Enter>**), and in the Description text box of the Program Item Properties dialog box, type something like **Scott's Desktop**. Now make a backup copy of PROGMAN-.EXE, open the original file in Write, and click *No Conversion*. Select *Find•Replace*, and in the Find What text box, type **&File**. Tab to the Replace With text box and type any four characters (which can include spaces anywhere in the string) plus an ampersand (&) before one letter (the letter for menu activation). Click *Replace All* and repeat the process, if you'd like, for &Options, &Window, and &Help, making sure all your replacements have the same number of letters as the original. Save the file and exit. When you restart Windows, you'll have a Program Manager like no one else's. —*Scott Dunn*

23. Off-Center Wallpaper

Windows lets you spruce up your screen with customized wallpaper. Nice idea, but can you ever see the stuff behind your open Program Manager? You can if you change the position of centered wallpaper so it's in a corner or at the top of the screen.

Select *File•Run*, type **WIN.INI**, and press **<Enter>**. Enter the lines **WallpaperOriginX=1** and **WallpaperOriginY=1** in the [Desktop] section. The default coordinates, 0 and 0, center your wallpaper on the screen. Other coordinates specify how many pixels from the upper left corner of the screen to begin the upper left corner of the wallpaper bitmap image. Negative values are allowed. —*M. D.*

24. Do-It-Yourself Start-Up Groups

Different tasks require different programs. Wouldn't it be nice if Windows automatically loaded only the programs you needed each day? It can.

Say your work falls into two main categories: finance and presentations. First, make an archive of your regular StartUp group: In File Manager, highlight *startup.grp* in the WINDOWS directory, and select *File•Copy*. Type ***.PRM** in the To text box and click *OK*, and you've created a permanent version of your normal StartUp group.

Now, in Program Manager, hold down the **<Ctrl>** key (to copy instead of move) while dragging the icons of all the applications associated with finance—for instance, a spreadsheet, a statistics package, and an accounting

application—into the StartUp group. Then delete the StartUp group icons of apps you don't need started for finance. Return to File Manager, highlight *startup.grp*, press **<F8>**, and type ***.FIN** in the To text box. Click *OK*, and your finance StartUp group is ready.

To build the presentations StartUp group, delete all the icons in the finance StartUp group and copy all the icons associated with presentations into it. In File Manager, select *startup.grp*, press **<F8>**, type ***.PRS** in the To text box, and click *OK*.

Type the batch file in the figure below into Notepad or any text editor. Save the file as **W.BAT** in a directory in your PATH statement. Now, whenever you type **W** and press **<Enter>** at the DOS prompt, you'll launch Windows. Type **W FIN** and press **<Enter>** to launch Windows and auto-load your finance StartUp group; type **W PRS** for presentations. To make this tip work for your own scenario, substitute the file extension of your choice for PRS and FIN and replace the occurrences of PRS and FIN with the command you want to type to launch Windows. Also, if you make changes to a group, be sure to copy its GRP file to its respective (PRS or FIN, for example) STARTUP file. —*M. D.*

```
@ECHO OFF
IF '%1==' COPY C:\WINDOWS\STARTUP.PRM C:\WINDOWS\*.GRP
COPY C:\WINDOWS\STARTUP.%1 C:\WINDOWS\*.GRP
C:\WINDOWS\WIN
```

LOAD WINDOWS WITH AN ALTERNATE START-UP GROUP using this simple DOS batch file.

25. Mo' Better Icons

While it's handy to assign icons to DOS apps so you can launch them from Program Manager, PROGMAN-.EXE's paltry selection of generic icons makes it hard to tell one DOS program from another. But there are more icons in Windows 3.1 than you might know about—more than 100—many designed specifically for DOS apps. And your applications may have additional icons hiding in their own directories.

To dig up and survey your treasure troves of icons, highlight the program item that needs a new icon in Program Manager and select *File•Properties* (or press **<Alt>-<Enter>**). Click the *Change Icon* button (if the 'no icons available' dialog box appears, select *OK*), click *Browse*, and then double-click the *moricons.dll* file from your WINDOWS directory to see an additional icon set. Scroll through the icons until you find the one you want, select *OK* twice, and the new icon appears on screen. To hunt for icons buried in applications directories, follow the same steps to browse your hard drive. Click on any EXE, ICO, or DLL file; if it contains icons, they'll appear in the display box. You can find more icons on PC World Online. —*D. T.*

26. Custom Windows Setups

If two or more people share the same copy of *Windows*, a batch file will let each use a different setting. (A single user can also use this trick to save multiple settings, say one for VGA and another for SVGA.) The batch file STARTWIN.BAT shows how:

```
@ECHO OFF
IF EXIST C:\WINDOWS\%1\NUL GOTO MAIN
MD C:\WINDOWS\%1
GOTO LOAD
:MAIN
COPY C:\WINDOWS\%1\*.* C:\WINDOWS
:LOAD
WIN
COPY C:\WINDOWS\*.INI C:\WINDOWS\%1
COPY C:\WINDOWS\*.GRP C:\WINDOWS\%1
COPY C:\WINDOWS\*.DAT C:\WINDOWS\%1
COPY C:\WINDOWS\WIN.COM C:\WINDOWS\%1
```

Entering STARTWIN CHRIS, for example, will create C:\WINDOWS\CHRIS, start *Windows*, and when you exit *Windows*, will save the current configuration files (including any revisions) to that directory. The next time you enter STARTWIN CHRIS, that configuration will be restored, overriding any changes made in the meantime. —*R. J. L.*

27. Direct Line to Control Panel

Many people prefer <Alt>-<Tab> to <Ctrl>-<Esc>'s Task List for switching between programs. If you're a member of this camp, why not put <Ctrl>-<Esc> to use for something else—such as launching Control Panel? In Program Manager, select *File•Run*, type **SYSTEM.INI**, and press **<Enter>**. Add the line **TASKMAN.EXE=CONTROL.EXE** below the [boot] section. Save the file, exit Windows, and restart. Now press **<Ctrl>-<Esc>** or double-click the desktop background, and Control Panel comes right up. —*Anne Desmond*

28. Make Windows Roadworthy

If you do a lot of work on the road, you know it's tough to manipulate windows with a trackball. Get ahold of Windows by making its application and document windows' borders wide enough to grasp easily.

Run Control Panel and launch Desktop. Click the up arrow on the right side of the Border Width box until you reach 6 or perhaps 8. Click *OK*. You'll see that your window borders have thickened considerably, allowing for easier mouse control. —*Karl Koessel*

Using Windows Tools

29. The Hidden Cache Monitor

You won't find it in the manual, but DOS 6.0 and 6.2 have SmartMon, a handy little utility that accompanies the SmartDrive 4.0 disk cache. SmartMon gives you a visual reading of cache activities and lets you optimize SmartDrive settings interactively. The

catch: Though it comes with DOS 6.0 and 6.2 and installs itself in your DOS directory, it's accessible only from Windows; it isn't even mentioned in DOS's online help.

To activate SmartMon, switch to Windows' Program Manager or File Manager, select *File•Run* and type **C:\DOS\SMARTMON**, or double-click on the file SMARTMON.EXE in File Manager. The monitor will appear on screen and you can play with various cache options until you find the best settings. If you plan on using this utility often, open File Manager, locate the file SMARTMON.EXE, and drag it into a Program Manager group to create an easily accessible SmartMon icon. —*S. F.*

30. Instant Screen Saver

Here's how to launch a supplemental screen saver from a hot key that password-protects your computer and tells your co-workers where you are. In Program Manager, choose *File•Run* and type **WIN.INI** to load your WIN.INI file into Notepad. In the [windows] section, add a space and **scr** to the list of file extensions following 'Programs='. Save the file, then quit and restart Windows. From a program group, choose *File•New* and click *OK* to create a new program item. In the Description text box, type **Lunch Screen Saver**. In the Command Line text box, enter **SSMARQUE.SCR /S**. Pick a shortcut key combination, say, <Alt>-<Shift>-S, and click *OK*. Now you need to create a second icon to edit the text of your screen saver. Hold down **<Ctrl>** and drag your newly created icon elsewhere in the program group to create a copy. Press **<Alt>-<Enter>** and type **Edit Screensaver** in the Description box. Delete the /S from the Command Line text box, change or delete the shortcut key, and click *OK*.

Now double-click your Edit Screensaver icon. In the Text box, type your message. Check the Password check box and click *Set Password*. Type a password as prompted and click *OK*. Click *Format Text*, increase the font size, and choose a color. Click *OK* twice to get back to Program Manager. From now on, when you want to edit your message, all you have to do is launch Edit Screensaver and type a new message in the Text box. To activate your screen saver, hit your screen saver hot key. This screen saver will run only when you type its hot key; your regular screen saver will work as usual. —*Rodney Bayron*

31. Playing the Recorder

You probably know that Windows' Recorder lets you build macros to perform repetitive tasks. But did you know that you can assign these macros to an icon and run them from Program Manager?

For example, I have a macro that loads Excel, opens three files I use every day, and tiles them. Here's how you'd set up this macro and assign an icon to it. First, fire up Recorder (in the Accessories program group) and select *Macro•Record*. In the Record

Macro Name text box, type something like **Load expenses**, and in the Description box, type an appropriate description. Make sure Playback To is set to Same Application, and assign a shortcut key combo—say, <Ctrl>-<Shift>-<F12> (you have to type **F12** or pick it from the drop-down list). Now click *Start*. Load Excel, and load each worksheet by pressing **<Ctrl>-<F12>**, typing its name, and pressing **<Enter>**. Arrange them as you want. Press **<Ctrl>-<Break>** when you're through, then click the Save Macro radio button and click *OK*. Switch to the Recorder window, save the macro in a file called **EXCELOAD.REC**, then close Recorder.

Now, in Program Manager, hold down **<Ctrl>** and drag the Recorder icon to copy it to an appropriate program group. Click the new copy once, press **<Alt>-<Enter>**, type a name in the Description box, then change the Command Line text box to **RECORDER.EXE -H ^+F12 C:\WINDOWS\EXCELOAD.REC**, give the icon a shortcut key, say **<Ctrl>-<Shift>-<F12>**, and click *OK*.

The –H tells Recorder to run the macro named by the shortcut key combination that follows. The character ^ signals <Ctrl>; + means <Shift>; % (not used here) indicates <Alt>. The path and file name that end the command tell Recorder what file the macro is in. From now on, you can run the macro simply by double-clicking on the icon or pressing its shortcut key combination. One small warning: Make sure Recorder isn't already running when you use the icon, or you'll have to double-click on the macro name or press its shortcut key combination to get it to run. —*D. T.*

32. Swap for Speed

When you run *Windows* in 386-enhanced mode, it frees up memory by building a temporary swap file on your hard disk. However, the file's constantly changing size can fragment your disk space and slow you down. Set up a permanent swap file, which doesn't fragment, to keep swap performance humming. Here's how:

First, exit *Windows*. Delete all unnecessary files from one drive or partition, then type CHKDSK/F at the DOS prompt to check your disk and free your drive of any file problems. Next, run a defragger such as Norton Speed Disk to optimize the drive, since permanent swap files can't use fragmented disk space.

Those chores done, start *Windows*, go to Control Panel, and double-click the 386 Enhanced icon. Click the *Virtual Memory* button, then click *Change*. Choose the drive you just optimized from the Drive list, then select *Permanent* from the Type list. You can accept the size recommended by *Windows* or type in a new value, depending on how much disk space you can afford to dedicate to the swap file. If

you see the Use 32-Bit Disk Access check box, make sure it's checked—it'll speed up disk access when you're running non-*Windows* programs. Click *OK•Yes*, then click *Restart* to restart *Windows*. —*G. C.*

33. Speed Dialing

If you have a Hayes-compatible modem connected to your phone line, you can use Cardfile to dial telephone numbers automatically. Launch Cardfile and choose *Card•Add* to create a new file card. Enter the name of a person you'll want to call, and click *OK*. Enter the phone number on the first line of the card, including a 1 and an area code for long-distance numbers. Leave out other prefixes. If you wish, you can add an address or other information.

To place a call, select *Card•Autodial* or press **<F5>**. If you haven't set up Cardfile to dial before, click the *Setup* button and click the appropriate radio button to tell Cardfile the speed of your modem, where it's hooked up, and whether to use tone or pulse to dial. If you need to use a prefix (such as 9), enter it in the Prefix text box and check the Use Prefix check box. Click *OK* or press **<Enter>** to dial. Wait for the prompt that tells you to pick up the receiver, click *OK*, and get ready to gab. Save your cards with an appropriate file name before exiting Cardfile. If you use this feature a lot, create an icon for this file (see Tip 25) and put it in your StartUp group so it's always handy. —*D. T.*

34. Does Defrag Damage Swap Files?

Windows users beware. After you defragment your disk, Windows may report that its permanent swap file is damaged and ask if you want to delete it. This is a bug, since the swap file is probably fine. But we still recommend you answer *Yes* and allow Windows to delete the swap file. Now in Control Panel, double-click on the 386 Enhanced icon and select *Virtual Memory•Change•OK•Yes•OK•Restart Windows* to re-create a new permanent swap file. —*S. F.*

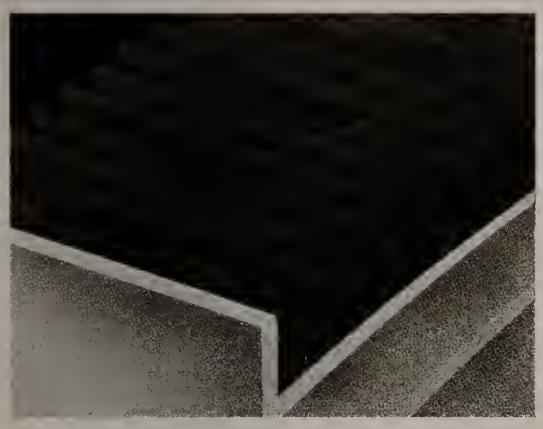
Doing DOS in Windows

35. DOS in the Right Place

If you're in File Manager and want to run a DOS session in your current directory, don't waste time toggling back to Program Manager's MS-DOS prompt. Just select *File•Run*, type **COMMAND**, and press **<Enter>**. —*L. S.*

36. Tap Into Windows' Command-Line Interface

File Manager can use wild-card characters (? and *) just as DOS can, but in some ways it's smarter: It lets you search for a series of wild-card file name masks in one fell swoop. Let's say you want to copy all your spreadsheet files—with XLS, XLW, WK1, WK3, and WKS extensions—to a floppy. In File Manager, click on your spreadsheet data directory and choose *File•Select Files*. Type ***.XL* *.WK*** (with a space between each set of masks).



Click on *Select* and *Close*, and File Manager highlights all the files that meet your criteria. —*M. D.*

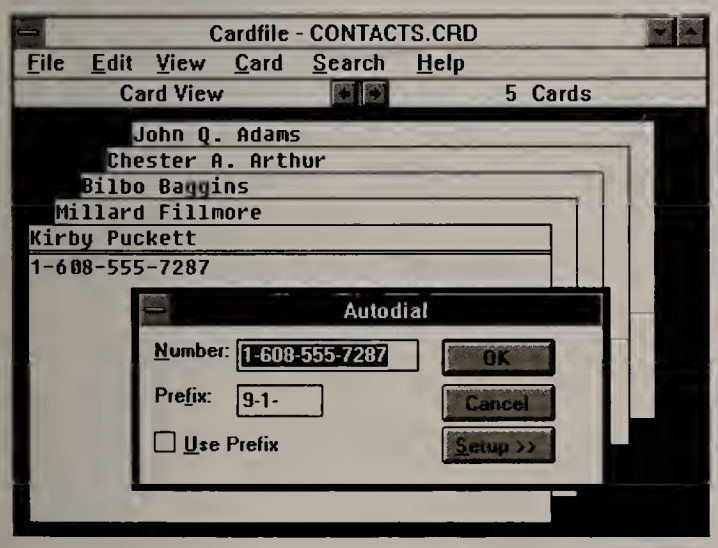
37. DOS Commands From Windows

You probably know you can run external DOS commands (those that have an executable file—like XCOPY, FORMAT, and EDIT—in the DOS directory) using Program Manager's File•Run command. But did you know you can also run DOS's *internal* commands—like DIR, DEL, TIME, CD (change directory), COPY, MD (make directory), RD (remove directory), and REN (rename)—from within Program Manager? Well, you can—if you use COMMAND.COM's /C switch. Just choose *File•Run*, then type **COMMAND.COM /C** followed by the command, and press **<Enter>**. In either case, when the command has finished, you return immediately to Program Manager, meaning you won't be able to peruse any screen output, like from a simple TREE or DIR command. But for resetting the time, making a directory, or redirecting a DIR listing into a text file, this technique can be quite handy. If you plan to run a few consecutive internal DOS commands, the first time you type COMMAND.COM /C, highlight it and press **<Ctrl>-C** to copy it. For subsequent commands, press **<Ctrl>-V** to paste the phrase into the command line. —*S. F.*

38. Faster DOS Apps Under Windows

Ever notice that your DOS applications seem to run a bit slower under *Windows* than under a virgin DOS prompt? No, you're not imagining things. In 386- enhanced mode, *Windows* steals a bit of time from your DOS apps to monitor other applications in case any of them wants to work in the background. If you don't need this feature, you can speed your work by preventing such multitasking when your DOS application is active.

To permanently disable this feature for any given



DIAL PHONE NUMBERS AUTOMATICALLY from cardfile. It's like having a set of speed-dial buttons on your computer.

DOS program, launch *Windows'* PIF Editor, and open the PIF (or create one) for the DOS application you want to speed up. Check the Execution: Exclusive box, and save the PIF.

You can also make this change for the current session. With your DOS program running, press **<Alt>-<Space>** to open the Control menu. Choose *Settings*, check the Tasking Options: Exclusive box, and click *OK*. For greatest effect, press **<Alt>-<Enter>** so the application will run full screen. —*S.D.*

39. DOS Speed and Multitasking, Too

If preventing *Windows* from monitoring any other application seems a bit extreme, here's a better solution: In the PIF Editor, leave the Exclusive box unchecked. Click the *Advanced* button, and type **10000** in the Foreground Priority box. Click *OK* and save the file. Your DOS program will get the CPU's full attention as long as it needs it but will permit other apps to run in the background when it's idle. You get faster performance without sacrificing multitasking.

The more memory some DOS applications get, the faster they run. If your DOS application does too, here is a way for you to give it all the RAM it can handle. Open the application's PIF in the PIF Editor and enter **-1** in the KB Desired box. Then save the PIF. —*S. D.*

40. DOS Clipboard Tricks

Do you think the Clipboard is just for Windows applications? Think again. You can use the Clipboard to cut and paste text between Windows and DOS apps—or even between two DOS apps. The key is running the DOS apps inside a window.

Switch to the DOS app you want to copy text from, and press **<Alt>-<Space>** to put it in a window and bring up the window's Control menu. Select *Edit•Mark* and use the mouse or hold down **<Shift>** and use the cursor keys to mark a block of text, then press **<Enter>** to copy it to the Clipboard. Move to the second DOS app and place your cursor where you want to add the new text. Press **<Alt>-<Space>** and select *Edit•Paste.* Then sit back and watch as the text pours into the file. To toggle back to full-screen mode, press **<Alt>-<Enter>**.

If nothing happens (or only a few characters appear) when you try to paste text, call up the destination DOS app's PIF file in the PIF Editor, click *Advanced*, and in the Advanced Options dialog box, uncheck the Allow Fast Paste box. —*D. T.*

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Feel
Like
A Kid
Again!
FLASH GORDON
SPACE OUTFIT
BIXBY
wrist
radio

Jim, age 8

"Oh boy, oh boy! I got it! I *got* it! HOT DOG! Wait till the gang sees this brand new shiny P5-100XL machine from Gateway 2000. Jumping gigabytes! I feel just like a kid again! I'm even more excited than when I got my Stream Line Electric train set back in 1958. I remember my brother Butch and I had a rootin' shootin' time making that train whiz around the track at lightening speeds. It was *the* most. But it can't compare to the powerhouse 100MHz Pentium processor-based system before me. It even has a quad-speed CD-ROM! I just wish Butch were here to see it. *(Hey Butch, na na na na na — I got the most awesome computer in the world this year! How's the box of orange wool socks from Aunt Doris?)* I think I'll invite Butch over to show off my new P5-100XL. We can watch full-motion video and hear stereo sound that rivals any home hi-fi with the ACS-31 speakers with subwoofer. I hear Gateway's multimedia features and software applications are more entertaining than watching Uncle Miltie. And I know if I ever have any questions about my new computer, the swell people at Gateway 2000 will always be there to help. Thanks Gateway, this has been the best holiday ever in the whole wide world!"

Just in time for the holidays, Gateway 2000® introduces the power-hungry user's dream machine — the P5-100XL. Make the day merry with a 100MHz Pentium™ processor, 4X CD-ROM, and Gateway's new Vivitron™ color monitor using Sony® Trinitron® tube technology. We can't candy coat it...this is quite simply the best computer you can get today!

100MHz Power Train

How could it be faster? It can't! The new Intel® 100MHz Pentium processor in Gateway 2000's P5-100XL is the fastest processor available today that still lets you run the most popular software applications. Imagine having everything on your computer running at full throttle! Previously only found in high-end file servers, now *you* can have the unsurpassed power and speed of a 100MHz processor right on your desk.

New 4X "Quad-Speed" CD-ROM Drive

Twice the speed of a double-speed CD-ROM! You'll be way ahead of the game with the fastest CD-ROM technology available today on your P5-100XL Pentium processor-based machine. Gateway's 4X "quad-speed" CD-ROM and 100MHz of computing power transform your system into a runaway power train. And with a throughput of 600KB per second, the quad-speed CD-ROM is the *only* way you can have true full-screen, full-motion video today. All today's and tomorrow's software applications fly, and video and animation are

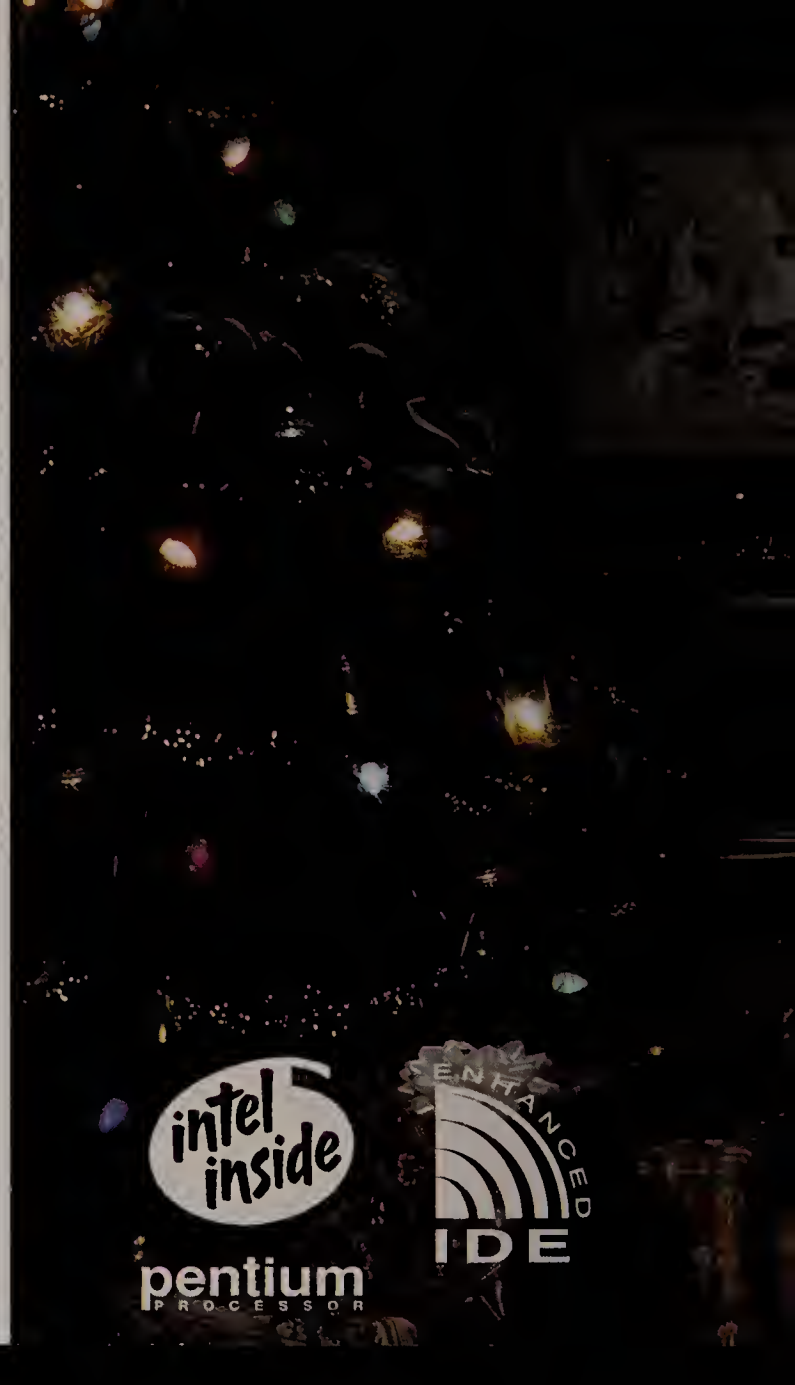
smoother and cleaner. Gateway's quad-speed CD-ROM includes a motorized tray and is ATAPI compliant, something you'll need when Microsoft® Windows '95 comes along.

Gateway's New Vivitron Color Monitors!

For decades, Sony Trinitron technology has been the choice for millions who insist on only the *very* best. Now the best computer system in the world is paired with the best screen display in the world. Introducing Gateway 2000's new Vivitron color monitors. Using Sony Trinitron tube technology, these monitors give you the highest quality screen images available. Our 17-inch Vivitron monitor, standard with the P5-100XL, gives you brighter, richer, and crisper colors, a sharper focus and clearer image. With a .26 fine pitch, you'll also get an incredibly high screen definition. The new Vivitron monitor is standard on all Gateway systems that include a 15-inch or 17-inch monitor.

Microsoft Office Professional

This collection of Microsoft's most popular software applications is pre-installed on your Gateway P5-100XL. You get Microsoft Word, Excel, PowerPoint® presentation graphics program, Access® database, and Bookshelf.® Bookshelf includes seven best-selling reference books that include *The American Heritage Dictionary, The Concise Columbia Encyclopedia,* and *The World Alamanac and Book of Facts.*



4:55 PM
10/1/94
100MHz
GATEWAY2000
800-846-2065

Ida, age 7

"I can't stand secrets. My husband and kids always hide my presents because they know I'll try to sneak a peek if I can. This year was no exception. I waited until they were all asleep, then padded down the hallway, crept down the stairs, very quietly...*yikes*...remember the second step creaks! And...oh, wow, HOORAY! It's a Gateway 2000 P5-75 Family PC! I didn't care if the whole family heard me. Did I feel like a kid again? You bet! Suddenly I was back in circa 1965, when a tip-toe trip to the tree meant first having to free Fluffy's claws from the gold shag carpeting. Then while reaching for my Howdy Doody slippers, I was suddenly rendered blind by the glare of the silver tree, and I went crashing through the aluminum branches and piles of presents! I woke up the whole house that year. *This* year I soared through a billion applications in mere seconds with the 75MHz Pentium processor in that Gateway machine. I was sure the vivid colors of the new 15-inch Vivitron monitor were going to jump right out of the screen! My husband says the friendly salespeople at Gateway made sure we got the computer just right for us. The entire family can join in on my fun, because this powerful multimedia system has something for all the 'kids' in this house!"

Your family's days and nights will be merry and bright with a P5-75 Family PC™ from Gateway 2000.®

Cruising at 75MHz

This full-featured multimedia Family PC is an investment in your family's future with a super-charged 75MHz Pentium™ processor, and all the included software applications in our Home Bundle run faster than ever!

Family PC Power

As your family grows and changes, this Pentium processor-based Family PC will always be in style. Power users are right at home with Intel®'s 75MHz Pentium processor and 730MB hard drive. For multimedia enthusiasts, a PCI local bus graphics card, double-speed CD-ROM, 16-bit sound card and Altec Lansing speakers are the coolest. And a TelePath™ fax/modem keeps everyone connected with the on-line universe. The Pentium processor lets you take full advantage of all these features and the many new generations of software applications. For tomorrow's multimedia superhighway, the P5-75 Family PC is your ticket to ride.

A Bright New Outlook!

Your P5-75 Family PC also includes Gateway 2000's new 15-inch Vivitron™ color monitor. All your colorful images will now be richer and brighter with Sony®'s Trinitron® tube technology built into these new monitors.

intel inside
pentium
PROCESSOR
ENHANCED
IDE

GATEWAY2000
800-846-2065

"Get outta my way!"

"Watch out Shelly, you doorknob! It's mine!"

"No, Shawn, it's mine!"

"Ah, it's just like being kids again, Shelly. Remember 1977? The presents, the fun, and Dad's dumb leisure suits? He'd always warn us, 'Kids watch out for that 8-track player, and don't touch your mother's shrine to Elvis!' We were *so* competitive, always fighting over each other's gifts. I'm glad we're all grown up now, and we get along so well, especially since you finally stopped being such a spoiled brat."

"Whatever, Shawn, I'm still Mom's favorite, you buttface."

"Well, I guess Gateway 2000's ColorBook and Liberty portable PCs have brought out the little hellions in us again. But we just can't help fighting over them!"

"Shawn's in awe of the Liberty's incredible infrared wireless transfer capabilities — and a bunch of other HUGE features!"

"And Shelly can hardly live with herself because she can't believe the great values on all ColorBook models."

"Gosh Shawn, isn't it nice to have Gateway 2000 here to make us feel like kids again?"

"Yeah, it sure is. In fact, Mom thought now would be a good time to tell you that we really adopted you from Martians."

Liberty™ DX4-100 Best Buy

Liberate yourself! Introducing the new Gateway 2000® Liberty color portable PC! This 4.2-pound computer is positively loaded with almost-unheard-of features, including a 10.4-inch color display and infrared technology allowing for wireless file transfer. Now you can transfer files between your Liberty and desktop PCs without cables to plug, unplug and lug around with you. Our top-of-the-line Liberty gives you 100MHz of computing oomph combined with a removable 720MB hard drive and 24MB RAM for an absolutely incomparable portable performance and value!

Liberty DX4-100 Best Buy

- 4.2 Lbs., 10" x 8" x 1.6"
- 10.4" DSTN Color Display
- 24MB RAM
- 720MB Hard Drive
- TelePath™ 14.4 XJACK Fax/Modem
- Microsoft® Office Professional

$4799

*ColorBook™ 486SX-33 QuickShip**

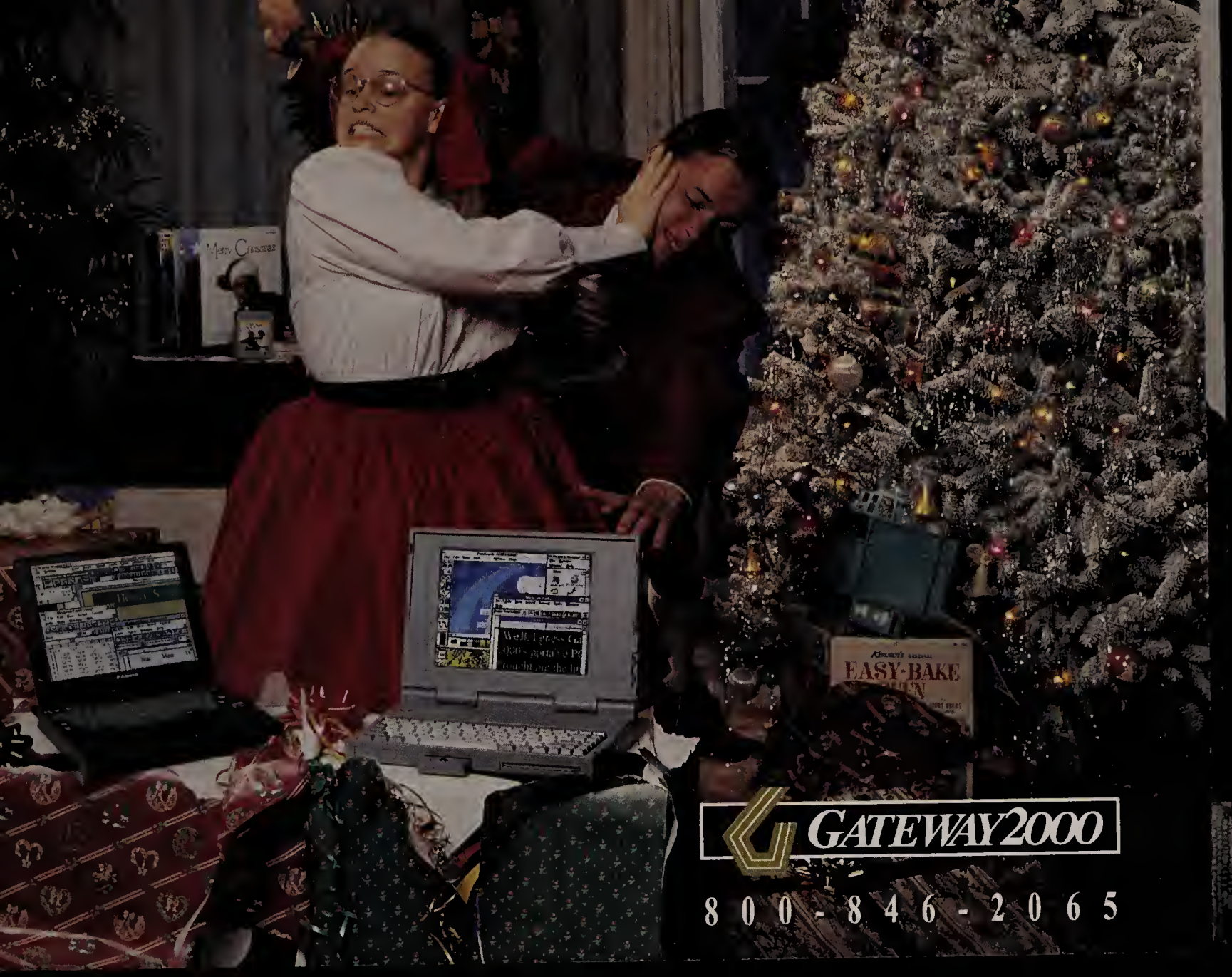
Quick! Make your (or someone else's) holidays brighter with a Gateway 2000 ColorBook — all models now priced at incredible values! You can have the ColorBook 486SX-33 QuickShipped to your door within 48 hours* of ordering. And there's no reason to worry about that hard-to-buy-for person on your list. Everyone needs the colorful desktop performance of a Gateway ColorBook! Call today and ask about these and other great deals on Gateway portables.

ColorBook 486SX-33

- 5.7 Lbs., 11.7" x 8.5" x 1.77"
- 9.4" DSTN Color Display
- 4MB RAM
- 250MB Hard Drive
- 96/24 Fax/Modem
- Carrying Case
- Microsoft Works

$1799

*48-Hour QuickShip program applies only to the ColorBook 486SX-33 configuration. Your PC will be delivered within two business days from the time of order. No additions or deletions can be made to the configuration. Available for approved credit card orders only. Domestic U.S. orders only.


EASY-BAKE
GATEWAY2000
800-846-2065

Rusty, Lily, Mary and John

"The warmth and fun of the holiday season is timeless. I guess with today's ultra-busy lifestyles, it's even more important to make memories and build traditions with family. Well, as long as you can stand sitting through the kids' 75 verses of 'Jingle Bells' and Uncle Ricky always stopping by to borrow the nutcracker. But years from now, my wife Lily and I will sit down to watch our holiday videos, and after we fast-foward past the cat eating tinsel off the tree, we'll remember how excited little John and Mary were to open that huge cow-spotted box from Gateway 2000. For just $1,899, Gateway gave us a full-featured multimedia system. And with all the great software titles pre-installed on our 4DX2-66 Family PC, Lily and I started feeling like kids too! Not enough to eat a whole tin of peanut brittle or anything, but we sure stayed up late that night exploring Microsoft Golf and Cinemania '95. Our Family PC has opened up whole new worlds for John and Mary, too. They've been entranced by MS Fine Artist, and Encarta multimedia encyclopedia. Lily and I are happy knowing that the fun and learning they experience with Gateway's 4DX2-66 Family PC will last them a lifetime."

The Gateway 2000® 4DX2-66 Family PC™ brings all the rewards of a fully featured multimedia system into your home at a price that defines "family values." Our Family PCs start from $1,499 for the 4DX2-50 model and include a local bus graphics card, double-speed CD-ROM, 16-bit sound card and Altec Lansing speakers for a quality audio system. Listen to your music CDs, experience all the sights and sounds of the included multimedia software, and connect with people from all over the world through the standard fax/modem, including communications and on-line software.

A Cornucopia of Software!

An incomparable array of software is included with all Gateway 2000 systems — the most you'll get for your money...anywhere. All Gateway 486 and Pentium processor-based desktops are pre-installed with Microsoft® DOS® 6.22, Windows™ for Workgroups 3.11, and *now* Microsoft Money.

The Incomparable Home Bundle from Gateway

All Gateway Family PC configurations include our Home Bundle. This incredible collection of Microsoft software applications has literally everything your family needs to work, play and learn at home. You'll get MS Works, Encarta '95, Money, Cinemania '95, Golf and Fine Artist.

Microsoft Works 3.0 for Windows Multimedia Edition

You'll never need another software package for your home office. This program combines: a word processor, spreadsheet

with graphing, database, electronic communications, financial analysis, charting and illustration.

Microsoft Encarta '95 Multimedia Encyclopedia

Learning is an adventure with text, images, animations and sounds that work together to create a fascinating universe of knowledge. Over 25,000 articles, 17,000 multimedia elements and the complete text of Funk and Wagnall's New Encyclopedia are included.

Microsoft Money 3.0

Now every Gateway desktop system includes Microsoft Money, your personal financial wizard that'll help you take control of your finances and plan for the future.

Microsoft Cinemania® '95

Explore the magic behind the movies with hundreds of reviews, biographies, photos and sound clips.

Microsoft Multimedia Golf

Traverse the wonder of Torrey Pines, consult a golf pro, and play a game of golf any way you please. You'll experience real sounds of chirping birds, swinging clubs and gurlgling water.

Microsoft Fine Artist

Kids can create animated pictures and projects like posters and comic strips, and hear dozens of wacky sounds!

MARY
DAD
MOM
JOHN
Artist
GATEWAY2000
800-846-2065

Gateway 2000® Family PCs™

4DX2-50 FAMILY PC

- Intel® 50MHz 486DX2 CPU*
- 4MB RAM
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Altec Speakers
- 2400/9600 Data/Fax Modem
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS® 6.22 & WFW 3.11
- MS Works,™ Encarta '95, Money,™ Cinemania '95, Golf & Fine Artist
- 3-Year Limited Parts Warranty

$1499

4DX2-66 FAMILY PC

- Intel 66MHz 486DX2 CPU*
- 8MB RAM
- 730MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Altec Speakers
- TelePath™ II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 14" CrystalScan® Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works, Encarta '95, Money, Cinemania '95, Golf & Fine Artist
- 3-Year Limited Parts Warranty

$1899

P5-60 FAMILY PC

- Intel 60MHz Pentium™ Processor*
- 8MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Altec Speakers
- TelePath II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 14" CrystalScan Monitor
- Desktop Case
- AnyKey® Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works, Encarta '95, Money, Cinemania '95, Golf & Fine Artist
- 3-Year Limited Parts Warranty

$2099

P5-75 FAMILY PC

- Intel 75MHz Pentium™ Processor*
- 8MB RAM, 256KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Altec Speakers
- TelePath II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 15" Vivitron™ Color Monitor
- Desktop Case
- AnyKey® Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works, Encarta '95, Money, Cinemania '95, Golf & Fine Artist
- 3-Year Limited Parts Warranty

$2499

P5-90 FAMILY PC

- Intel 90MHz Pentium Processor*
- 8MB RAM, 256KB Cache
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- 16-Bit Sound Card & Altec Speakers
- TelePath II 14.4K Fax/Modem
- 3.5" Diskette Drive
- 15" Vivitron Color Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works, Encarta '95, Money, Cinemania '95, Golf & Fine Artist
- 3-Year Limited Parts Warranty

$2899

The Special Treatment Only From Gateway 2000

Gateway's friendly employees are dedicated to providing our customers with only the best service and support. We'll custom configure any system to your specifications. You also get toll-free technical support for the life of your system and a 30-day money-back guarantee. All Gateway 2000 desktop PCs and monitors are backed by a three-year limited warrany on parts. Call or write us and we'll send you a free copy of our warranty.

GATEWAY2000 FamilyPC

Professional Systems

4DX2-50

- Intel 50MHz 486DX2 CPU*
- 4MB RAM
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 14" Color SVGA Monitor
- Mini Desktop Case
- 101-Key Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Works & Money
- 3-Year Limited Parts Warranty

4DX2-50 $1299

4DX2-66 $1599

(w/ 540MB Hard Drive & 8MB RAM)

P4D-66

- Intel 66MHz 486DX2 CPU*
- 8MB RAM, 256KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Vivitron Color Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional, Bookshelf & Money
- 3-Year Limited Parts Warranty

$1899

P5-75

- Intel 75MHz PentiumProcessor*
- 8MB RAM, 256KB Cache
- 730MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Vivitron Color Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional, Bookshelf, & Money
- 3-Year Limited Parts Warranty

$2299

P5-90 BEST BUY

- Intel 90MHz Pentium Processor*
- 8MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 15" Vivitron Color Monitor
- Desktop Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional, Bookshelf & Money
- 3-Year Limited Parts Warranty

$2499

P5-100XL

- Intel 100MHz Pentium Processor*
- 16MB RAM, 256KB Cache
- 1 GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- ATI Mach 64 with 2MB VRAM
- Quad-Speed CD-ROM
- 16-Bit Wavetable Sound Card & Altec ACS-31 Speakers w/ Subwoofer
- 3.5" Diskette Drive
- 17" Vivitron Color Monitor
- Tower Case
- AnyKey Keyboard & Mouse
- MS-DOS 6.22 & WFW 3.11
- MS Office Professional, Bookshelf & Money
- 3-Year Limited Parts Warranty

$4299

Easy Payment Options

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers.

Gateway 2000 DuoLine™ MasterCard® card

You can apply for the Gateway 2000 DuoLine MasterCard card, issued by Dial National Bank, Des Moines, Iowa. Be sure to ask about our "90 Days No Payment" Program! The program ends December 31, 1994.

Ask about our "90 Days No Payment" Program

90 DAYS NO PAYMENTS

*Intel Verified: Upgradable

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Celebrate the season with festive extras from Gateway!

Gateway 2000 peripherals and software sold only with purchase of a system. Systems can be custom configured with the options listed below pre-installed.

Multimedia

Audio Starter Kit

Here's everything you need to add multimedia to a Gateway PC.

- Gateway 2000 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with MIDI/game port, mic in, stereo line in/out
- 2 Altec Lansing ACS-5 speakers
  $99 *(with system purchase)*

Wavetable Audio Multimedia Kit

Once you've heard wavetable audio, basic audio will never do!

- Ensoniq Soundscape 16-bit wavetable sound card, MT-32 and FM mode compatible. Supports most software for popular sound cards and standards including General MIDI, Sound Blaster, AdLib, Roland MPU 401, MS Windows Sound Sytem and MT 32
- New Altec Lansing ACS-31 three-piece speaker system
  $249 *(with system purchase)*
  $119 *(to upgrade from systems that include the Gateway 16-bit sound card and Altec speakers)*

Altec Lansing ACS-31 Speakers

A Gateway exclusive from Altec Lansing: a three-piece speaker set at a two-piece price. Two 3-inch free-standing speakers crank out up to five watts per channel while the subwoofer can deliver 15 watts of heart-pounding bass.
$99 *(with system purchase)*
$60 *(to upgrade from systems that include Altec speakers)*

Multimedia Software Starter Pack

You get nearly $700 worth of software for less than $100! Package includes Mad Dog McCree, Tuneland, Mayo Clinic Family Health Book, Better Homes and Gardens Cookbook, The Lawnmower Man, Sitting on the Farm, Mavis Beacon Teaches Typing, Chess Master 3000, U.S. Atlas and World Atlas. You also get a compact disk cleaner and 20-disk storage rack. **$75**

Call and ask about flight pack software including some of the latest flight titles from Gateway.

Monitor

New Gateway 17-Inch Vivitron™ Color Monitor

Non-interlaced color monitor using Sony® Trinitron® tube technology, capable of 1280 x 1024 resolution in non-interlaced mode, .26 fine pitch.
Upgrade from a 14-inch CrystalScan® 1024NI monitor **$360**
Upgrade from a 15-inch Vivitron 1572 monitor **$260**

Communications & Storage

TelePath™ II Fax/Modem

Internal fax/modem, 14,400bps modem, V.32bis, with 14,400bps fax capability. Includes data and fax communication software, CoSession™ Host remote diagnostics, plus a CompuServe® trial membership. **$99**

Colorado Memory Systems® TBU

250MB internal tape backup unit copies up to 9.5MB per minute. Comes with Microsoft® Windows™ and DOS® software, one tape and cable. **$149**

Printers

Epson® Stylus™ 800+ Ink Jet Printer

Get the look of a laser at a dot matrix price with the Stylus 800+. Prints 165 characters per second at 360dpi — fast and quiet!
Includes parallel cable. **$219**

Epson ActionLaser 1100 Laser Printer

Get advanced laser printing at a personal laser price. Features include edge-smoothing technology for incredible sharp printing of text and graphics, 22 fonts and 1MB memory.
Includes parallel cable. **$459**

Epson Stylus Color Ink Jet Printer

A high-quality color printer at an affordable price! Features 360dpi or up to 720dpi using specially coated paper. Exclusive technology eliminates "feathering."
Includes parallel cable. **$529**

Hewlett®-Packard 4L LaserJet Printer

A full-featured 300dpi printer loaded with enhanced PCL 5 and 26 scaleable typefaces with 1MB standard HP Memory Enhancement Technology.
Includes parallel cable. **$699**

Hewlett-Packard 4P LaserJet Printer

A 600dpi printer for four times the dots of 300dpi laser printing with enhanced PCL 5 and 45 scalable typefaces. 2MB standard memory and 3 universal SIMM slots available for additional memory or PostScript fonts.
Includes parallel cable. **$999**

Call for other printer options, including more ***Hewlett-Packard*** *printers.*

Call the Gateway 2000 special component add-ons division at 800-846-2080 for our complete line of extras for Gateway customers.
Sales hours: 7am-9pm Weekdays.

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GATEWAY 2000 LIBERTY™

- 4.2 Lbs., 10" x 8" x 1.6"
- 10.4" DSTN Color Display
- Infrared Capability
- Intel® 486, DX2 or DX4 Processor
- NiMH Battery & AC Pack
- Removable Hard Drive
- 2 PCMCIA Type II Slots
- EZ Point™ Integrated Pointer
- 78-Key Keyboard
- Parallel, Serial, VGA & PS/2® Ports
- Microsoft® Works for Windows™ 3.0 or MS Office Professional
- MS-DOS® 6.22 & WFW 3.11

LIBERTY DX2-50

- 10.4" DSTN Color Display
- 8MB RAM
- 340MB Hard Drive
- MS Works

$2799

LIBERTY DX4-100

- 10.4" DSTN Color Display
- 8MB RAM
- 540MB Hard Drive
- MS Works

$3499

LIBERTY DX4-100 Best Buy

- 10.4" DSTN Color Display
- 24MB RAM
- 720MB Hard Drive
- TelePath™14.4 XJACK Fax/Modem
- MS Office Professional

$4799

COLORBOOK™

- SL Enhanced Intel 486 or DX2 Processor
- 10.3" or 9.4" DSTN Color Display
- 4MB or 8MB RAM (Expandable to 20MB)
- 5.7 Lbs., 11.7" x 8.5" x 1.77"
- Removable Hard Drive
- 3.5" Diskette Drive
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 2 PCMCIA Type II Slots (1 Type III)
- Integrated Trackball (2 buttons)
- 85-Key Keyboard
- Parallel, Serial, PS/2 & VGA Ports
- MS Works 3.0 or MS Office Professional 4.3
- MS-DOS 6.22 & WFW 3.11
- Carrying Case

COLORBOOK 486SX-33

*48-Hour QuickShip**

- 4MB RAM
- 250MB Hard Drive
- 9.4" DSTN Color Display
- MS Works
- 96/24 Fax/Modem

$1799

COLORBOOK DX2-50

- 8MB RAM
- 340MB Hard Drive
- 10.3" DSTN Color Display
- 96/24 Fax/Modem
- MS Office Professional

$3149

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90 DAYS NO PAYMENTS

Ask about our "90 Days No Payment" Program

**48-Hour QuickShip program applies only to the ColorBook 486SX-33 configuration. Your PC will be delivered within two business days from the time of order. No additions or deletions can be made to the configuration. Available for approved credit card orders only. Domestic U.S. orders only.*

LIBERTY OPTIONS

- Extra NiMH Batteries **$99** Each
- 4MB RAM Upgrade **$249**
- 16MB RAM Upgrade **$899**
- Extra AC Adapter **$65**
- Carrying Case **$79**
- External Floppy Drive **$109**
- Extended VIP Warranty. We'll ship a replacement notebook within 24 hours during the warranty period. Must be purchased at point of sale. **$100**

PCMCIA Cards

- TelePath™ 14.4 Fax/Modem **$149**
- TelePath XJACK® Fax/Modem **$159**
- External Tape Backup Unit **$295**
- Token Ring Adapter **$449**
- BNC Ethernet Adapter **$159**
- Twisted Pair Ethernet adapter **$129**

Liberty Traveler's Pack

- External 3.5" Diskette Drive
- PCMCIA TelePath XJACK 14.4 fax/modem
- Extra NiMH Battery
- Leather Carrying Case **$399**

Liberty Professional Pack

- Microsoft® Office Professional
- PCMCIA TelePath XJACK 14.4 fax/modem
- Extra NiMH Battery
- Leather Carrying Case **$449**

Liberty Combo Pack

- 124-Key AnyKey® Keyboard, 15" Color Monitor, Microsoft Mouse and Gateway Cow-Spotted Mouse Pad. **$449**

COLORBOOK™ OPTIONS

- Extra NiMH Batteries **$119** Each
- 4MB RAM Upgrade **$249**
- Extended VIP Warranty. We'll ship a replacement notebook within 24 hours during the warranty period. Must be purchased at point of sale. **$100**

PCMCIA Cards

- TelePath 14.4 Fax/Modem **$149**
- TelePath XJACK Fax/Modem **$159**
- BNC Ethernet Adapter **$159**
- Twisted Pair Ethernet adapter **$129**
- External Tape Backup Unit **$295**
- Token Ring Adapter **$449**

ColorBook Traveler's Pack

Includes extra NiMH battery:

- With PCMCIA 96/24 fax/modem. Includes fax and communications software **$219**
- With PCMCIA TelePath XJACK 14.4 fax/modem **$279**

ColorBook Combo Pack

- 124-Key AnyKey Keyboard, 15" Color Monitor, Microsoft Mouse and Gateway Cow-Spotted Mouse Pad. **$449**

SERVICE AND WARRANTY

- Lifetime toll-free service and support.
- One-year limited parts warranty.
- 30-day money-back guarantee.
- Special VIP warranty – we ship replacement to you within 24 hours during warranty – is available at the time of purchase for an additional $100.

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"You've got a friend in the business."®

800-846-2065

Happy Holidays From All Your Friends At Gateway 2000!

A final bow from the Gateway 2000 employees and family members who acted like kids for this ad! Thanks Cowboy Jim (Public Relations), Leisure Suit Joe (Customer Services), Elizabeth a.k.a. "Shelly" (Creative Services), Shawn (Creative Services), '60s Ida (Accounting), '90s Dad Rusty (Marketing), his wife Lil, and kids Caneel and Danny.

energy EPA POLLUTION PREVENTER

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Toll free from Puerto Rico
800-846-3613

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International FaxBack Access 605-232-2561 • Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

OME BAC
wish
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1. The logical way.
The Sound Blaster™ Discovery CD™ 16 kit includes everything you need to explore the expanding universe of multimedia. And now it's more affordable than ever. You get a Sound Blaster 16-bit sound card, double-speed CD-ROM, stereo speakers, microphone and 15 cool software titles.
SRP, $349.95

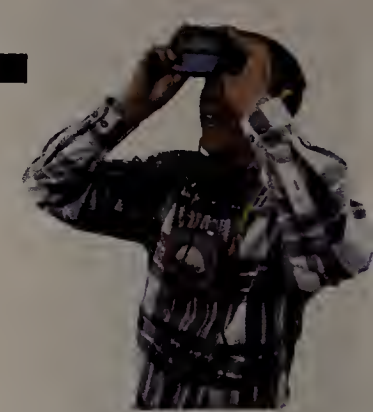
2. The intelligent way.
Sound Blaster Digital Schoolhouse™ is the antidote to mindless video games. It turns an ordinary PC into an awesome educational system that even makes math and spelling cool. You get a Sound Blaster 16-bit sound card, double-speed CD-ROM, plus 20 of the hottest educational software titles and more. SRP, $399.95

3. The take-no-prisoners way.
The most powerful forces of the gaming universe have come together. And now they're coming to get you. Game Blaster CD™ 16 brings together a Sound Blaster 16-bit card, double-speed CD-ROM, plus games to die for, like Rebel Assault and SIM City 2000. So be careful out there. SRP, $549.95

Six new ways to blast into multimedia.

4. The ultimate way.
Educational software, games, cool creative software. The Sound Blaster Edutainment CD™ 16 gives you a Sound Blaster 16-bit sound card and double-speed CD-ROM. Not to mention over 40 of the planet's most captivating software titles and lots more. Or get the same kit with an external CD drive in the Sound Blaster Edutainment EZ™ 16.
SRP, $599.95 EZ SRP, $749.95

5. The inexpensive way.
The Creative OmniCD™ 2x is the leanest, meanest CD-ROM upgrade in the cosmos. The 2x CD-ROM makes all your software more exhilarating. And it makes you more productive. With 6 cool software titles, you can dive into multimedia right out of the box. SRP, $299.95



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Why Your Financial Future Now Looks Brighter

Planning your financial future will probably get easier once the Microsoft-Intuit deal is completed. That's the good news; the bad news is that the rest of the software business is less likely to have a future, financial or otherwise.

Sure, I may be overreacting a bit. Still, I fully expect to wake up one morning and find Microsoft towering over its competitors—small companies such as Lotus, Novell, and Borland—which will have retreated to defendable niches. At Microsoft's feet will be the really small companies living off building add-ons for Windows 95 and Microsoft Office.

Competing With the Monolith

And that's fine, except that a Microsoft without competition will be a very lazy company. If you don't believe me, think back to the improvements that came to MS-DOS with version 5.0—better memory management and a new, more humane editor—which followed competitive features in DR DOS 6.0, now owned by Novell. Once Microsoft has vanquished its rivals, it's possible the firm will put the brakes on desktop software development and look for someplace more exciting and profitable—say, cable television—to place its bets.

This is not a call to buy non-Microsoft products just to ensure freedom of choice. I don't expect you to do that, but I do hope you'll give other companies a chance. Sure, nobody ever got fired for buying Microsoft, but that's what they used to say about IBM. And look what happened when Big Blue hit the rocks.

But this is a product column, not a sermon, and when I think about the products a combined Microsoft and Intuit can create, I find myself smiling. Intuit CEO Scott Cook is probably the nicest guy in the industry, and he's committed to helping all of us not screw up our finances and retirement plans. Considering Quicken's track record, Cook is not someone I'd bet against.

With all the changes in banking, the stock market, and corporate benefits (not to mention health care), Cook warns that many people are headed for fiscal disaster and don't have a clue how to put their financial house in order and prepare for such inevitable budget busters as college tuition and retirement. His plan: Create software and online services that provide all the information you need to make informed financial choices and easily execute your decisions. Cook envisions desktop software embedded in the financial system, as much a part of daily life as ATMs and checkbooks. Ease of use will, of course, be critical. Fortunately, that's an area Intuit knows better than just about any other software company.

It may be nine months or so before the first Microsoft-Intuit software appears—if the feds don't hold up the deal. But don't shed too many tears if that happens. I think Intuit is on too much of a roll to stumble very far, so I'll just keep expecting great things and hope this situation somehow works out.

Air Communicator

If you absolutely, positively need to send data over a cellular phone today, skip those add-on devices and head straight to the Air Communicator, a cell phone with a big difference. At $1595 list, it's optimized for both voice and data and has a specially modified built-in modem. The cellular network is a hostile place for data due to fading, cell handoffs, sudden dropouts, and the occasional system crash. To cope with these surprises, a cell modem must be able to handle retries, automatically adjust its speed, and sit through signal loss while waiting for a connection to resume. Nothing is perfect, but I've yet to see anything that works nearly as well as the Air Communicator. • *Air Communications; 800/247-3282. Reader service no. 785*

Contributing Editor David Coursey edits P.C. Letter. He can be reached on PC World Online (see page 12 for contact information).

By David Coursey

LOOKING AHEAD

This is amazing, but everyone who's seen me use Maxis's new Gift Maker wants a copy. Gift Maker is a $44.95 Windows application for creating full-color personalized items such as baseball caps, T-shirts, jackets, coasters, coffee mugs, and so on. More important, Gift Maker is a cool way to create custom marketing premiums, team items, or giveaways. Prices for the ready-to-personalize items range from $10 to $70. Maxis, 800/336-2947...My friend David Rose has another cool customized item: a business card, of sorts, on a disk. Actually, ReachMe is a Windows application you use along with a modem to send text messages to an alphanumeric pager. ReachMe, which sells for as little as $3, is personalized for each customer. All the customer does is type a message and click Send, and the message appears on your pager within seconds. Ex Machina, 800/626-8607...The new version of allClear from Clear Software (800/338-1759) is the best flowcharter for Windows that I've seen. Micrografx (800/653-2610) has new versions of its ABC flowcharter as well.

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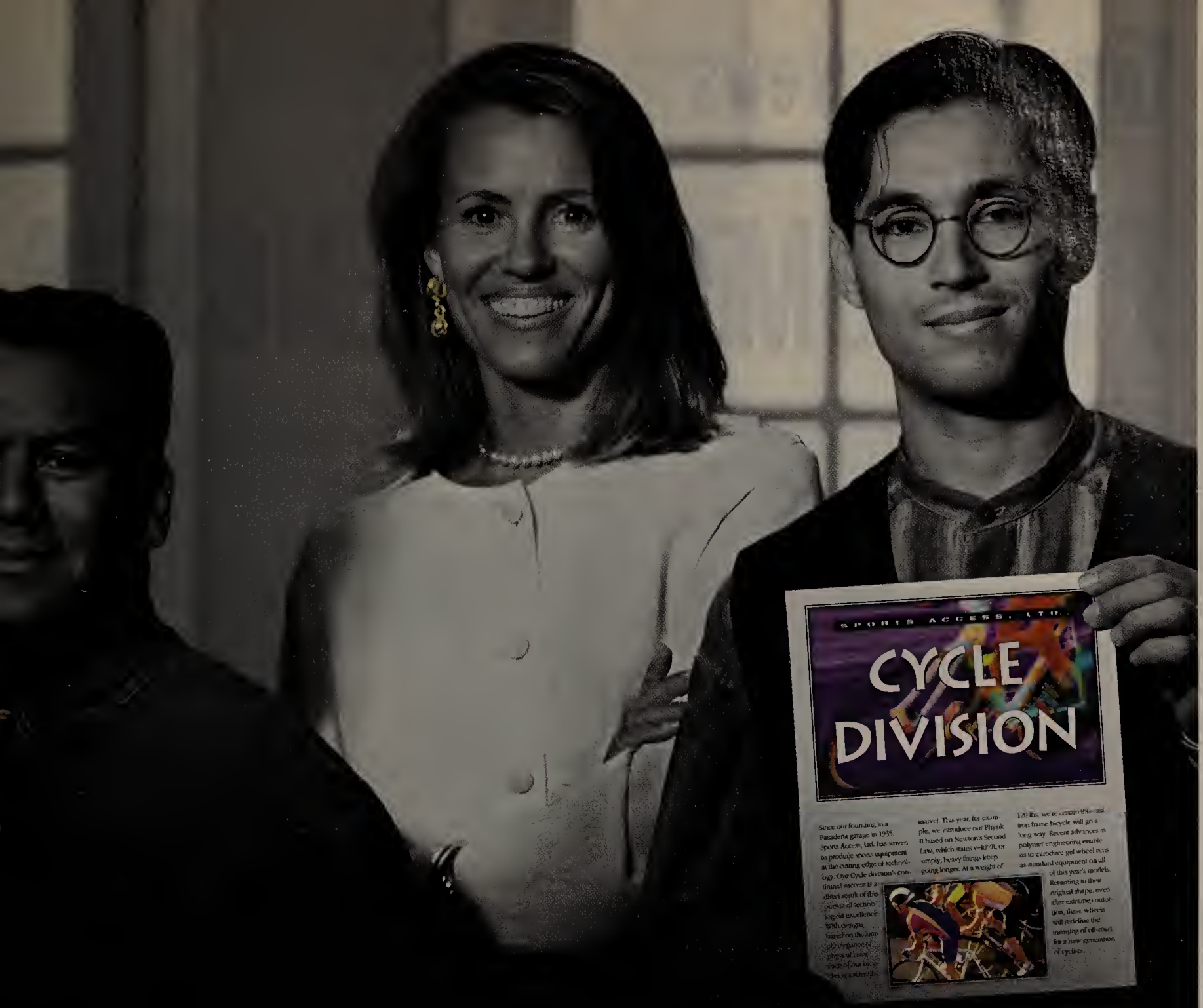

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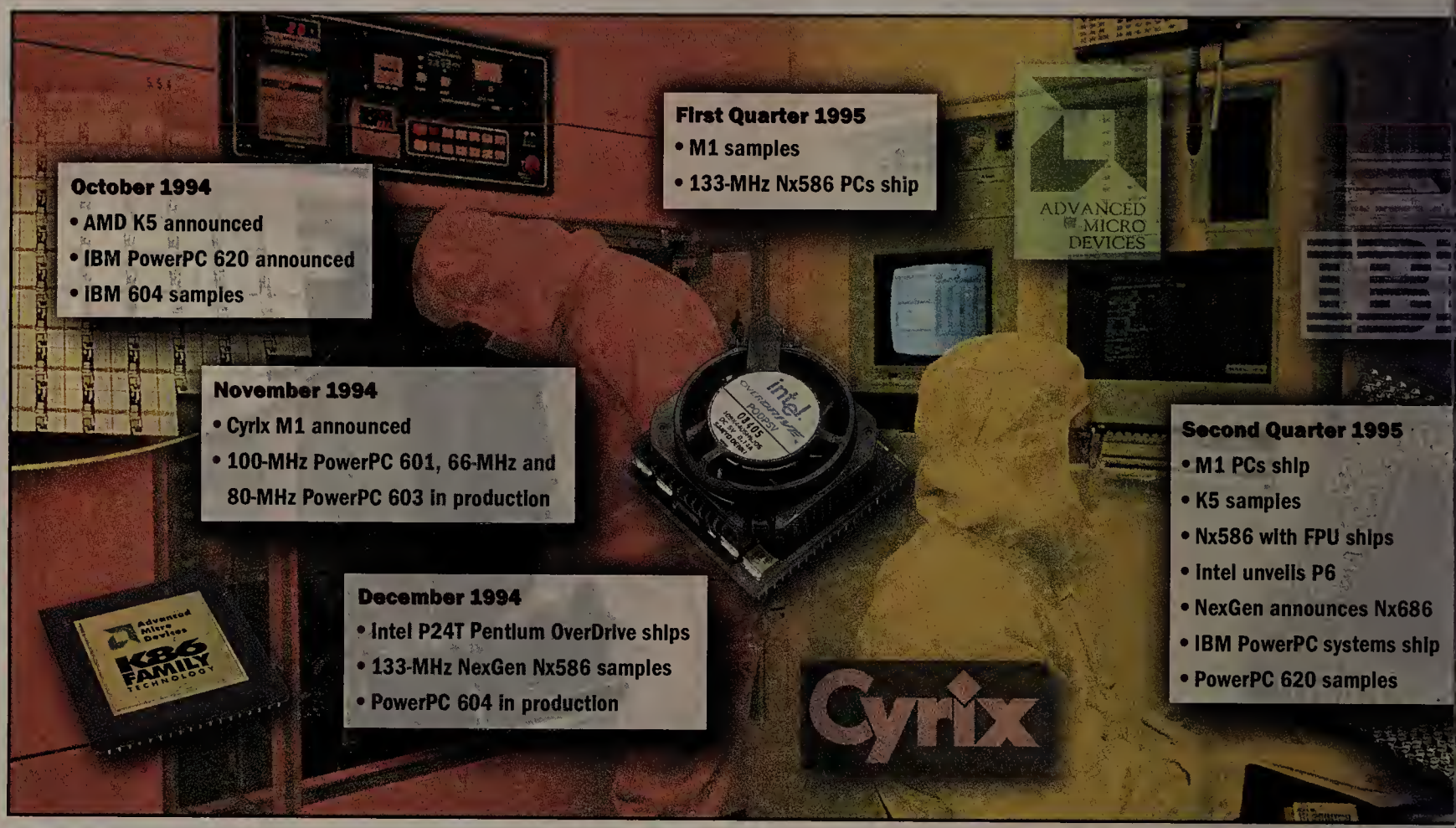


This year look for AMD, Cyrix, and NexGen to break Intel's monopoly in high-end processors by offering chips that promise up to 30 percent better performance than the 100-MHz Pentium.

There's nothing like a little competition to shake things up. After more than a dozen years alone at the top, Intel now finds itself battling with three other companies to make the fastest Intel-compatible chip. NexGen has already proven that its Nx586 can deliver slightly better performance than Intel's Pentium (see "Top 20 PCs: Power Systems, Budget Prices," December 1994). But the big news is that in addition to Intel and NexGen systems, you should be able to buy PCs in 1995 based on one of two new chips—AMD's K5 and Cyrix's M1—that both promise to outperform Intel's 100-MHz Pentium by 30 percent.

This new rivalry has two obvious benefits: With three formidable challengers in hot pursuit, Intel will be quicker with advanced offerings like the 150-MHz Pentium and the next-generation P6. Better still, Intel will be forced to compete on price across its product line—so even the fastest PCs could become much easier on the wallet.

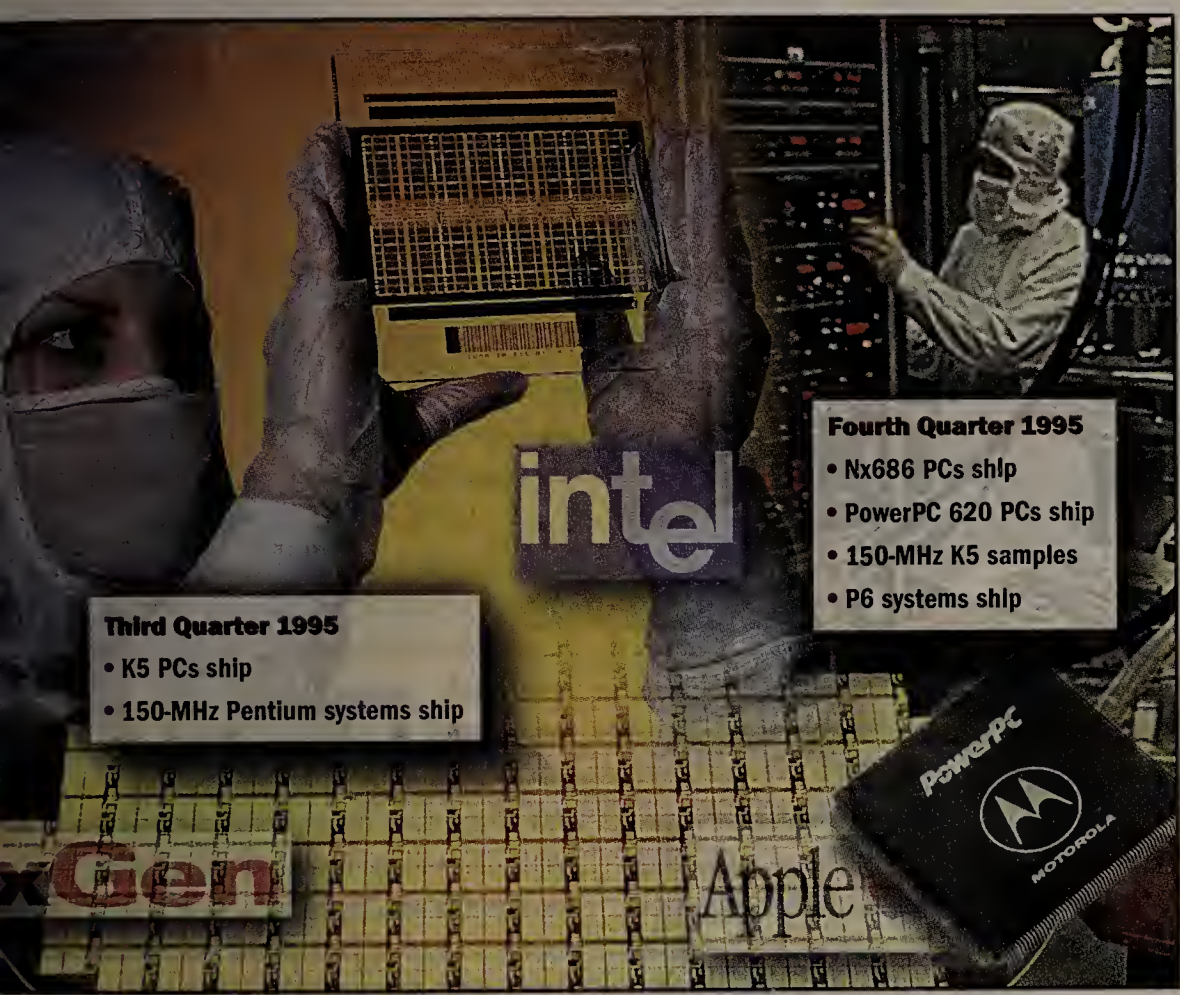
PC vendors are also applauding the competition because it helps them market distinct products. Intel's "Intel Inside" campaign has riled many PC vendors, chief among them Compaq, because the campaign's emphasis on the chip devalues the unique qualities of individual systems and helps promote a commodity PC market. If the chip make is immaterial, PC vendors can retain their brand identity by engineering systems that stand out in other ways.

Cheap at Twice the Price...

Last year competing 486 chips from AMD, Cyrix, and IBM forced Intel into a brutal 486 price war—the cost of Intel's 66-MHz 486DX2, for example, fell from nearly $500 to less than $200—as AMD garnered 13

Edited by Russell Glitman

GEAR UP IN '95



percent of the 486 market. During that same period, PC vendors passed those savings on to you: The average price of a fully loaded DX2-66 dropped from around $2000 to approximately $1500.

This trend seems certain to accelerate. Desperate to lower prices without cutting profits, PC vendors are delighted by the emergence of Pentium competition for Intel. The mere approach of competitors and their success in the 486 market have already caused Pentium prices to fall faster than those of any past Intel processor. Still, many vendors say Intel's Pentium prices are too high, and express frustration at the company's periodic chip shortages and favoritism toward certain customers. As Cyrix director of desktop marketing Dan Auton puts it, "Intel has made a lot of enemies."

"PC vendors want the processor market to be more like the PC market—with the same low margins," notes analyst Michael Slater, president of MicroDesign Resources. "With viable alternatives to the Pentium, PC vendors will buy them even if the price and performance are the same, just to foster competition."

...And Just as Nice

In case you're wondering, no significant compatibility problems have turned up with any of the clone chips now on the market, and even Intel declines to suggest that such problems will emerge in the future. Just ask AST and Compaq: Both these system vendors enjoy sterling reputations for quality, and both now use AMD 486 chips in several of their models. Moreover, Compaq is evaluating both the K5 and the M1 chips for use in their 1995 products. As long as the chips meet promised performance and compatibility claims, we can expect to see them

News Monitor

NEW PLATFORMS: IS THE GLASS HALF FULL...Analysts gave mixed reviews to the IBM and Apple announcement that they would develop a common hardware platform. "What's positive is that they've finally agreed to a specification for hardware that will run the Macintosh OS," says Dominic Ricchetti, director of advanced desktops market research for Dataquest. "What's negative is that it's not the platform that people are designing to today. It's going to be so long before this is delivered to consumers (probably in 1996) that the Intel and Windows 95 architectures are the default choices."

...OR HALF EMPTY? Karl Wong, Dataquest's principal analyst for PC software, says IBM may have missed a great opportunity by failing to license the Mac OS for use on IBM's upcoming PowerPC desktops. Such an arrangement was sought internally by IBM's PC division, but IBM's Personal Software Products, the driving force behind OS/2 Warp, thought its 32-bit operating system should be the future OS. Wong says Warp is likely to gain only one or two percentage points in sales in the next year, due to Microsoft's superior marketing capabilities. A last-minute installation bug that halted the flow of Warp into the retail channel didn't help either. The product is now shipping.

FLOPPY ALTERNATIVE? As files increase in size, the 1.44MB floppy seems less and less useful. Enter Iomega's new Zip drive, which uses

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PHOTO ILLUSTRATION: JEFF BERLIN; INTEL CHIP PHOTO: JOHN GREENLEIGH; TECHNOLOGY PHOTOS: TOM WAY, IBM CORP.; ILLUSTRATION: DANIEL PELAVIN

in future Compaq products ranging from servers to the popular Presario, says Jim Paschal, a Compaq vice president.

The Challengers Strut Their Stuff

Over the next few months, expect to hear more about the inner workings of microprocessors than you ever wanted to know. AMD, Cyrix, and NexGen are all using different strategies to try to beat Intel's Pentium at its own game—and they're not shy about explaining how they're doing it.

One of the first claims you're likely to hear involves the number of *x*86 (that is, Intel-compatible) instructions these processors can execute in a single clock cycle. For example, while Intel has always said that the Pentium can execute two *x*86 instructions simultaneously, AMD claims the K5 can do four. In fact, the Pentium, the K5, the M1, and the Nx586 should all *average* between one and one-and-a-half *x*86 instructions per cycle. That's one reason the K5 promises a relatively modest 30 percent edge over the Pentium at the same clock speed, the same advantage predicted for the M1. The Nx586 delivers a barely noticeable 7 percent increase (see the figure "Chipping Away at Intel").

The number of *execution units*—the processing engines within these chips that actually do the work—will be another issue. Like the Pentium, the M1 has two units, while the Nx586 has four and the K5 has five, but this doesn't necessarily mean the M1 can execute fewer *x*86 instructions per cycle. While the Pentium and M1 chew on the CISC (complex instruction set computing) instructions normally processed by *x*86 CPUs, both the K5 and the Nx586 translate *x*86 CISC instructions into shorter but more numerous RISC (reduced instruction set computing) instructions. The K5 and Nx586 may have more execution units, but their RISC cores have more to do.

Whenever a processor tries to execute more than one instruction at a time—as all these do—it creates a big problem: What happens if one instruction depends on the results of another? To mitigate this, the challengers include *out-of-order execution* and *speculative execution*. Out-of-order execution enables a processor to find and execute related instructions in the same instruction stream. Speculative execution goes further: It begins processing both branches before the CPU knows which path will be taken, abandoning the incorrect branch once the correct direction is known.

Had enough yet? Well, don't forget the size of the on-chip cache: NexGen's Nx586 has 32K, while AMD's K5 has 24K and Cyrix's M1 and Intel's Pentium have 16K. In the cache department, the Nx586 has another big advantage: It's the only proces-

Chipping Away at Intel

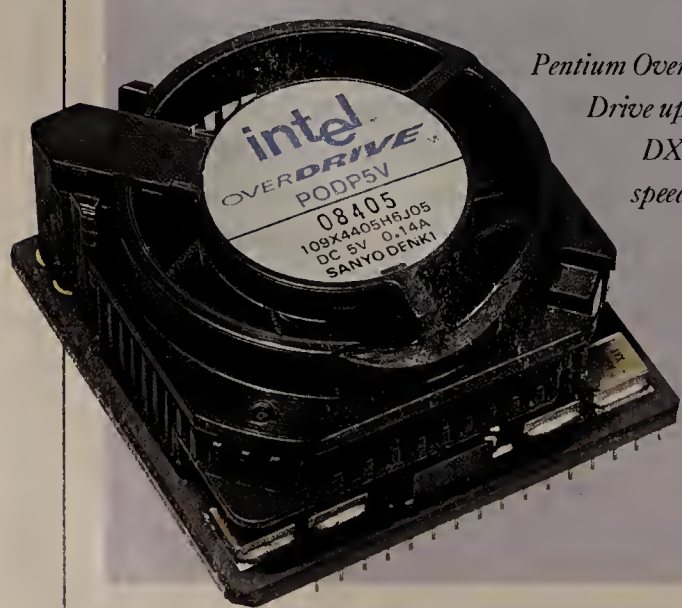
Pentium competitors prepare alternatives.

	AMD K5	Cyrix M1	NexGen Nx586	Intel Pentium	Intel P6
Clock speeds (MHz)	100	100	75 to 93	90 to 100	133
Availability in PCs	Q3	Q2	immediate	immediate	Q4
Relative performance advantage[1]	30%	30%	7%	0%	100%
Instruction set architecture	RISC	CISC	RISC	CISC	unannounced
Total on-board cache (K)	24	16	32[2]	16	32
Transistors (millions)	4.2	3	3.5	3.2	6

[1]Versus Pentium at same clock speed. [2]Includes integrated cache controller.

The Pentium Goes Into OverDrive

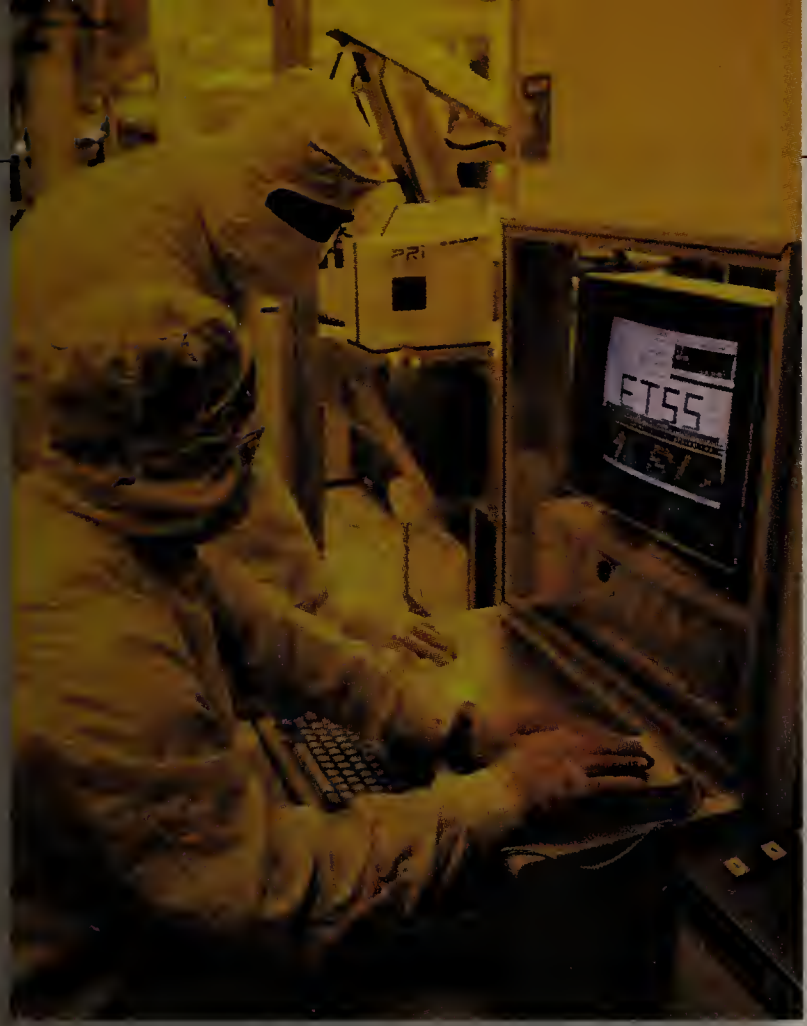
By the time you read this, you may at long last be able to buy an Intel Pentium OverDrive chip. Touted by Intel over two years ago as a painless way for 486 users to move up to Pentium performance, this upgrade CPU plugs into the 238-pin OverDrive socket in many DX2 systems. While the chip should finally be available by year-end, unfortunately at press time it was not ready for testing.



Pentium OverDrive ups DX2 speed.

Intel, however, has released its own performance numbers, and they're not especially rosy. The company says the Pentium OverDrive should deliver about a 50 percent gain in processing speed over a DX2-66—the same increase Intel advertised for the DX4-100 when it was introduced. Technically, this suggests the Pentium OverDrive *will* provide Pentium performance—that of a Pentium-60, that is. With DX4 OverDrives going for $450 and offering to boost 486SX performance to close to Pentium levels (see "Upgrades: When They're Worth It, and When They're Not," November 1994), it seems unlikely that the Pentium OverDrive will be worth the presumably higher price (pricing was also unavailable at press time).

Not to say that shoehorning a 3.3-volt processor with a 64-bit data bus into a 486 machine is a trivial task. To begin with, the Pentium OverDrive has a 32K cache—twice the size of an ordinary Pentium's—so it can work on more data in fast cache memory instead of fetching bytes from the 486's slower 32-bit memory bus. With its 3.3-volt core, the chip also has a voltage regulator to function in the 5-volt OverDrive socket. In addition, it has a fan to keep cool—a good thing, since not all system vendors were



YOU CAN'T MAKE JUST ONE: IBM workers put the finishing touches on a batch of chips. IBM is making Cyrix CPUs.

sor with a built-in cache controller, which enables the secondary cache to run at the same high speed as the chip itself.

Who Gets There First

The K5 and M1 will have another advantage over the Nx586: Both will fit in the same 296-pin socket as Intel's 90- and 100-MHz Pentium. But Nx586 systems are available now, whereas K5 and M1 systems won't be ready until midyear at best.

How many systems are delivered depends largely on chip manufacturing capacity. Both NexGen and Cyrix employ the ample chip fabrication services of IBM, while AMD relies on its own manufacturing process, which is still ramping up.

Manufacturing technique is another competitive area, mostly because it affects the top clock rate at which these chips can run. The K5 and M1 will run at 100 MHz in their initial versions, while the Nx586 currently tops out at 93 MHz, with a 120- to 133-MHz version in full production by March. All three companies say they can "easily" reach 150 MHz—the clock speed projected for the next version of the current Pentium.

Revenge of the P6

Although challengers are clearly eating away at Intel's technology advantage and high profit margins, there's little doubt that Intel can stay a step ahead in performance. Pentium systems running at 150 MHz should be faster than 100-MHz M1 and K5 systems and should be available in roughly the same time frame. More to the point, PCs using Intel's next-generation processor, the P6, may well ship by year-end.

John Hyde, Intel's technical marketing manager for the P6, claims the new chip will offer twice the performance of a 100-MHz Pentium. It will also incorporate many of the innovations touted by competitors, including speculative execution and an integrated controller for a secondary cache.

However, with 6 million transistors—as opposed to the K5's 4.2 million, the Nx586's 3.5 million, and the M1's 3 million—the P6 will likely be more expensive to produce.

Despite the claims and counterclaims, there are two certainties to be gleaned: In 1995 you'll have more PCs to pick from, and you'll pay less for them.

—Eric Knorr

careful to ventilate their boxes sufficiently to accommodate a hot Pentium chip.

These innovations aside, Intel has publicly admitted that the Pentium OverDrive won't work in all systems that have a Pentium OverDrive socket, so you need to check with your PC vendor or Intel. All in all, the high cost of retrofitting seems unlikely to make this chip a hot deal, except in the literal sense. Later this year, however, watch for future Pentium OverDrives designed to upgrade *Pentium* systems. Intel's keeping mum about these chips, but you can probably expect a more impressive boost from them—along the lines of what Intel's own capable DX2 OverDrives did for DX systems.

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25MB and 100MB disks with dimensions not much bigger than a 3½-inch floppy's. Disks should retail for about $10 and $20, respectively. Iomega says the diminutive, portable drive will be available in parallel port and SCSI versions by spring for as little as $200 on the street. It also says the SCSI model will be as fast as a hard drive. The drive will include utilities for maintaining a library of files and applications across multiple disks.

BUY AIRLINE TICKETS VIA THE INTERNET: American Travel of Raleigh, North Carolina, has launched a free, Internet-based PCTravel airline reservation and ticketing service. Using the Internet's telnet tool, which lets you log on to remote computers, users can connect to pctravel.com and access the Apollo Reservation System, which supplies flight, fare, and schedule information for over 200 airlines. You purchase tickets through PCTravel, and they're delivered via Federal Express within the continental United States.

BIG COMPANIES TO DOUBLE PC INVESTMENTS: In the next five years, many Fortune 1000 companies will double their information technology budgets in order to set up electronic connections with customers, according to a study completed in fall 1994 by Forrester Research. Today, a Fortune 1000 company spends an average of 2 to 4 percent of total revenue on its MIS budget. By the year 2000, that amount could double, Forrester predicts. Also by the year 2000, up to 40 percent of a Fortune 1000 company's

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PHOTOS: LEFT, JOHN GREENLEIGH; ABOVE, TOM WAY, IBM; ILLUSTRATION: DANIEL PELAVIN

Feds Delay Microsoft-Intuit Merger

Federal officials are now investigating whether the Microsoft-Intuit merger is a calculated move to dominate the software industry. But Bill Gates's real designs are on something much more important: your wallet.

In an unusual step, the Department of Justice put the deal on hold in November as it continued its antitrust investigation of Microsoft. Justice Department officials are seeking additional information from Microsoft and Intuit executives while reviewing complaints from competitors. A critical issue: how the merger will affect the nascent market for electronic commerce.

The $1.5 billion deal is the latest effort by Microsoft to establish the services and products necessary to be the nexus of your financial transactions—from paying bills to getting a loan to buying stocks. Another key effort will be Microsoft's online service, The Microsoft Network (code-named Marvel), due to launch this spring with Windows 95. Once these are in place, you'll have electronic access to everything from bank statements to money market accounts. Of course, this electronic exchange won't be free; Microsoft is expected to charge a small fee—perhaps only pennies—on every electronic transaction you make via its products.

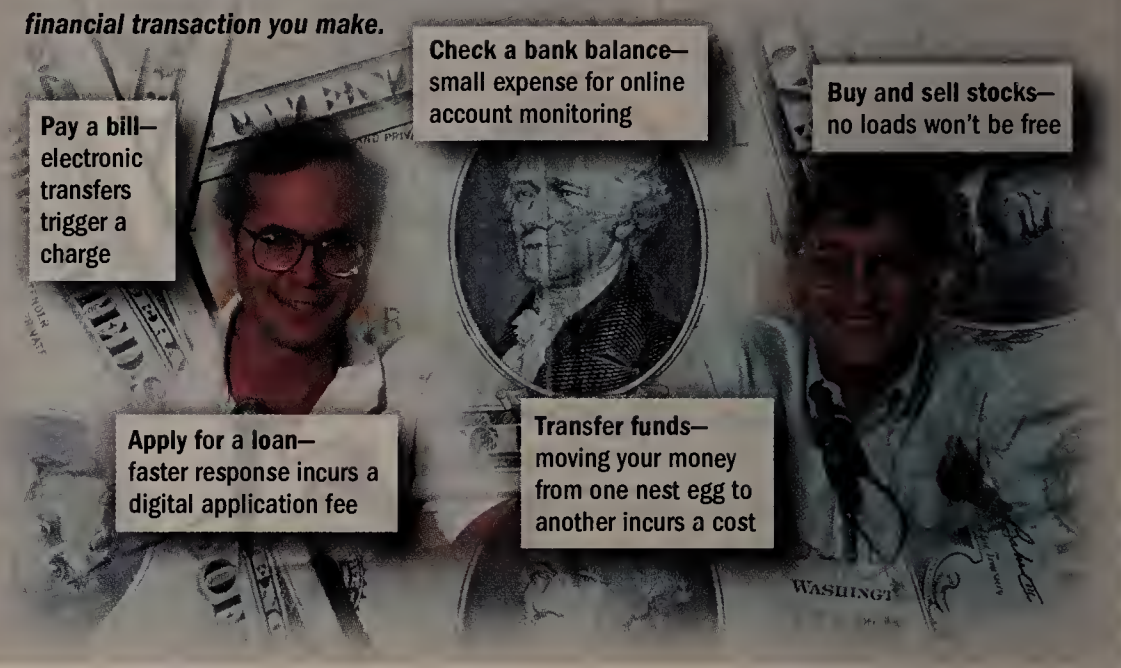
Microsoft and Intuit aren't the only firms hoping to capitalize on what is expected to be the killer application in home computing. Their competitors include Novell, which is buying Microsoft's personal finance product Microsoft Money as part of the Intuit deal; H&R Block, which owns CompuServe and Intuit rival Meca Software; and Computer Associates, which has a personal finance and a tax package. And most major banks and financial institutions are scurrying to make deals that will set them up to figure prominently in the new marketplace. Last year Chase Manhattan, Chemical Bank, Citibank, and Bank of America all rushed into the home banking market by offering PC services.

Why is Intuit so important to Microsoft? This relatively tiny, $121 million revenue software house makes the Quicken personal finance package, the market leader in a category Microsoft has unsuccessfully tried to dominate with Microsoft Money. Gates is expected to use Quicken as a financial front end to The Microsoft Network, which in turn will connect you to your bank, credit agency, brokerage firm—even retailers and, perhaps, future Microsoft financial services.

Under the terms of the merger, Microsoft Money will be sold to longtime Microsoft nemesis Novell, which will sell the product as part of WordPerfect's Main Street (Novell's consumer products division) line and pay Microsoft a royalty on each copy sold. The acquisition of Money is the second component of Novell's competing effort to enter the personal finance market; it acquired exclusive North American marketing rights to Parsons Technology's tax product in September 1994, which Novell now

Fiscal Control

Intuit's Scott Cook and Microsoft's Bill Gates stand to make money on every electronic financial transaction you make.



Land of the Giants

The proposed 1994 Microsoft-Intuit merger caps a year of unprecedented industry consolidation.

Companies (announcement date)	Estimated value in millions
Microsoft–Intuit (October)	$1500
Novell–WordPerfect (March)	$1400
Aldus–Adobe Systems (March)	$525
Pearson–Software Toolworks (March)	$462
Computer Associates International–The Ask Group (May)	$309
Lotus Development–Iris Group (May)	$84
Macromedia–Altsys (October)	$70
Symantec–Central Point Software (April)	$60
Caere–Calera (October)	$35
Manzanita Software–State of the Art (October)	$14

sells as TaxSaver for DOS and Windows.

"Personal finance is the killer application for the consumer market," says Jeff Mallett, vice president and general manager of Novell's consumer products division. Mallett said three factors were critical to the decision to proceed with the purchase: the progress made on the next upgrade, Microsoft's bundling arrangements with Gateway 2000 and Packard Bell, and the relationships that Microsoft has forged with financial institutions. With Money 3.0, Microsoft offers a slew of electronic banking features to customers of four regional banks. Microsoft also has a home banking arrangement with Chase Manhattan Bank.

All existing arrangements, as well as a pending deal with a "major credit card company," are part of the purchase agreement for Money. The credit card deal is so critical, in fact, that if it falls through, "the transaction is at risk," says Mallett.

A New Electronic World Order

Should the merger go through, Intuit chair and founder Scott Cook will become Microsoft's executive vice president of electronic commerce. Though he's been criticized by some for "selling out" to Microsoft, Cook described his decision to join forces with Gates as "a trade-off between being a big fish in your own pond with independence versus really trying to change the world...in the way people manage their financial lives."

Intuit has been leading the charge toward electronic commerce. In 1992 it introduced its own credit card, which enabled Quicken users to easily download all their credit card transactions. With the purchase of software developer ChipSoft in 1993, the company acquired the leading tax package and the ability to offer electronic tax return filing. And last July Intuit purchased National Payment Clearinghouse, Inc. (NPCI), which delivers electronic banking, bill payment, and stock quote retrieval services to consumers. Ironically, NPCI provides the electronic services for Microsoft Money customers but not for Quicken customers. It's a good bet that that will change.

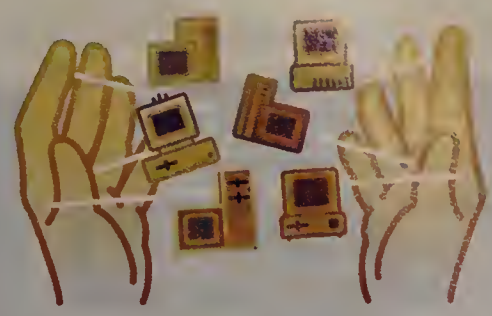
One thing Quicken users don't want to change is Intuit's commitment to its customers and its responsiveness to their changing needs.

"I felt sort of sad when I heard about the merger," says Dodie Beauchamp, a self-described Quicken devotee in San Clemente, California. "[Intuit] has such a good attitude about customers; I hope Microsoft doesn't just absorb them...that they continue to be receptive," she notes.

Personal finance is the "killer application," says Novell's Jeff Mallett. With Money, Novell's in the game.

Microsoft's success in the software industry is no assurance that it will dominate personal finance. This time, Gates is up against an entirely new set of competitors with hundreds of years of wily experience at making money: financial institutions.

"Microsoft isn't necessarily going to win," explains William Bluestein, senior analyst for people and technology at Forrester Research in Cambridge, Massachusetts. "The PC industry has a way of awarding Microsoft the position of winner before it has done anything, [but] Microsoft has a lot to prove in the financial services arena."



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MIS budget will be allocated for customer applications, up from less than 10 percent today.

SOFTWARE BY SATELLITE: IBM and Hughes Network Systems announced plans to distribute software to retail stores and corporate customers by satellite, using Hughes DirecPC satellite technology and IBM software. Pilot tests will begin in first quarter 1995. One of the first applications will be interactive kiosks that sell software in retail stores. For consumers, this distribution system could ease inventory gaps, improve selection, and allow for easy transmission of upgrades and bug fixes, analysts say.

WORLD'S SMALLEST DISK? SunDisk, a Santa Clara, California, manufacturer of flash memory cards, has announced its smallest storage device to date. CompactFlash is an ultrathin (3.3mm thick) wafer less than half the size of a PCMCIA Type I card. It stores 2MB, 4MB, 10MB, or 15MB of data and is compatible with most major operating systems, including DOS, Windows, OS/2, and the Mac's System 7. SunDisk says consumer electronics products like personal digital assistants, cell phones, pagers, and digital cameras will begin using CompactFlash by mid-1995. OEM prices will range from $75 for the 2MB card to $250 for the 15MB model. For PC users, SunDisk will sell a standard PCMCIA Type II CompactFlash adapter card.

Edited by Randy Ross

Contributors: Joe Abernathy, Jeff Bertolucci, Rex Farrance, and Laurianne McLaughlin

PHOTO: RAVELL CALL; ILLUSTRATION: DANIEL PELAVIN

Bluestein says that while banks may have ignored the creeping progress of technology into their markets during the last few years, other financial institutions have been wide awake and have moved to offer competitive electronic offerings.

And so have Microsoft's competitors.

Taking what its management describes as a bank-friendly approach, Block Financial Software has teamed up with many banks and financial institutions to provide home banking applications. A Citibank version of Block's software has been shipping for about a year, and Nations Bank will introduce its version of Managing Your Money by mid-year. Block last year announced a deal with Visa Interactive to develop the front end for that company's home banking product.

Cash on the Barrel

So, if it happens, what will this merger look like for consumers? Microsoft and Intuit aren't talking specifics, but look for them anywhere money flows. "Wherever there is a concentration of technology that requires software, that's where we'll try to play," says Mike Maples, Microsoft executive vice president of product development. "The flow of electronic commerce represents a big benefit to consumers. And the people who provide it will make some money," he adds.

And although both Gates and Cook have said repeatedly that they hope to do all this in partnership with financial institutions, many observers see it otherwise. One reason for their concern is a now infamous *Newsweek* article that appeared last summer, in which Gates described banks as dinosaurs.

"That quote reverberated through banks like you wouldn't believe," says Bluestein. The Microsoft-Intuit deal only adds to their fears. "It sounds an alarm bell for financial companies. Microsoft is interested in their business."

All the planning and jockeying aside, the deal won't be completed until the Department of Justice signs off. Although Microsoft competitors are unlikely to publicly object to the merger, privately they are talking to the Department of Justice. In any case, the close scrutiny by the antitrust division of the Department of Justice is going to add at least several months to the process. Gina Talamona, a spokesperson for the Department of Justice, wouldn't comment on the investigation except to say that as part of last July's consent decree, Assistant Attorney General Anne Bingaman in the antitrust division said she would keep a close watch on Microsoft. By mid-November quite a few software executives had already made the trek to Washington, D.C.

QUICKEN DEVOTEE Dodie Beauchamp: Saddened by the deal, she hopes the good service continues.

Wired Money

Whether Microsoft ultimately succeeds, one thing is clear. Lucre is going electronic, and as it does, the way we handle our money and think about our finances will change. Unless you only use cash.

—Roberta Furger

Reality Check

Multimedia: Is Business Buying It?

▶ **Name and rank:** Mitch Siegel, PC purchasing agent for Teradyne, a Fortune 1000 company in Boston that manufactures engineering and test equipment.

▶ **1994 computer products budget:** $1.2 million for software and hardware for both Macs and PCs.

▶ **PC vendors:** Desktop machines: Dell's Dimension series in 66-MHz 486 and 60-MHz Pentium models. Micron's 60-MHz Pentium systems. Custom-configured systems from a local retailer. Notebooks: IBM ThinkPads and Dell Latitudes.

▶ **Are you buying multimedia systems?** "We haven't made the full commitment yet." Siegel buys systems with double-speed CD-ROM drives preinstalled, but he eschews sound cards, microphones, and speakers—he can't justify their expense for most of his users.

▶ **The killer app for CD-ROM:** PCs with CD-ROM drives preinstalled offer a significant benefit that justifies their cost: They save time when installing large software packages like Microsoft Office, which requires 23 floppy disks, he says. Using the CD-ROM version, the user inserts one disk and can perform other tasks while the system installs the application suite. (Teradyne has no centralized staff to support PCs, so employees are on their own when it comes to choosing and installing software. Anything that makes their work easier is welcome.)

▶ **Advice for those considering a multimedia system:**

1. Consider your applications. Do they require a sound card and speakers, or will a CD-ROM drive suffice?
2. Consider your work environment. If workers are in open cubicles, adding speakers is going to create noise and distraction. (Headphones can also close workers off from each other.)
3. Have vendors preinstall and preconfigure components.
4. Don't overbargain. If you squeeze the lowest price out of your vendor now, you might get less service later.
5. Expect to spend about $100 to $150 more for a system that has a double-speed IDE CD-ROM drive and about $200 to $300 more for a similar system with a double-speed SCSI CD-ROM drive.

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LAPTOP BUYERS GUIDE & HANDBOOK "...the WinBook XP is a great Windows PC, and an excellent value." "...the fact that you get the amount of performance we did from a battery charge speaks highly of the engineering that went into the WinBook XP." *LAPTOP BUYERS GUIDE & HANDBOOK*, First Look, Dec. 1994

COMPUTER SHOPPER "In terms of value,...(the WinBook XP) ranks above many famous-name notebooks. And in terms of pointing devices, it's definitely got them out-numbered." "...if you're looking for a well-equipped, wallet pleasing portable, the WinBook XP deserves a spot on your short list." "...the WinBook with modem is $700 less than a comparably equipped, modemless (Dell Latitude XP) 475C." *COMPUTER SHOPPER*, PC Reviews, Nov. 1994

WINDOWS MAGAZINE "The WinBook XP represents the best kind of innovation in the rapidly changing field of notebook computers. It keeps the best of proven technologies, such as a sharp display, and complements them with new technologies, such as those employed to stretch battery life. The long battery life makes it a good choice for anyone who needs a basic notebook that also delivers solid performance." *WINDOWS MAGAZINE*, WinLab First Impressions, Dec. 1994

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Best-Integrated Business Suite: PerfectOffice 3.0

TEST DRIVE

When Novell bought WordPerfect Corporation and Borland's Quattro Pro spreadsheet last summer, it signaled a major realignment of the PC industry. And now, with Novell's release of PerfectOffice 3.0, we're finally getting to test the company's vehicle for changing how PCs and people work together. The package's innovative design presents a clear challenge to Microsoft Office, which holds the pole position in the business suites race.

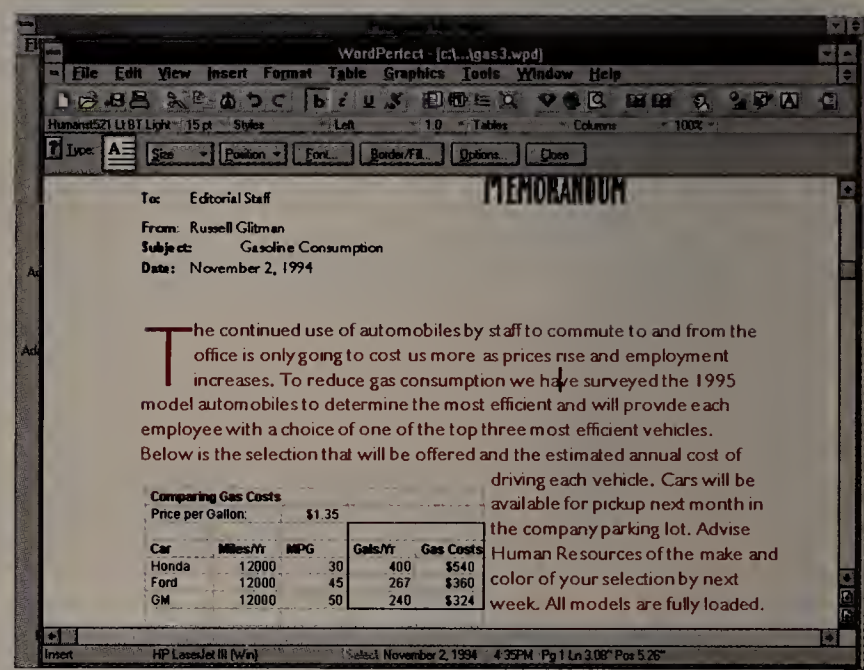
The Vision Thing

Novell's vision represents an ambitious rethinking of the "information at your fingertips" concept first expressed by Bill Gates, in which your interactions with the PC are centered not around tool kit or file cabinet metaphors, but rather around typical tasks, projects, colleagues, organizations, and your to-do list.

In ancient times, before Windows 3.0, the work you did on your PC was organized like a tool kit, program by program: You had to purchase and learn separate applications, and sharing data between them was difficult, if possible at all. With Windows 3.0, Microsoft invited you to think of your PC as a file cabinet: Launch File Manager (where you've organized your work into tidy directories), find a document, and double-click it, and Windows then launches the corresponding program. The latest enhancement to Windows, OLE, reinforces this approach by enabling you to use several applications to construct a single document.

The beta version of PerfectOffice that we used redefines the computer workplace. Activities center around the Desktop Application Director (DAD), a customizable collection of application icons that you can place anywhere on your screen. From the DAD you can call up QuickTasks, a list of common tasks such as Create Agenda (which launches WordPerfect and opens the agenda template), Create Budget (a Quattro template), and so on. Clicking on the QuickOpen button pops up a list of recently opened documents from all applications.

If you want to ascend the learning curve, there are workgroup applications: GroupWise, general workgroup software; and InfoCentral, a personal information manager. The work you do in any application is stitched together by OBEX (Object Exchange). The workgroup programs integrate personal and workgroup activities with the application software to an unprecedented extent.



TEXT WRAPS AROUND a Quattro Pro spreadsheet in a WordPerfect document. Change the data by double-clicking it, and...

GroupWise integrates E-mail and group scheduling functions. Provided your organization is equipped with a VIM-, MAPI-, or MHS-compliant E-mail system, GroupWise lets you manage your E-mail, schedule meetings with colleagues, route voice-mail messages, keep your calendar, and so on. Once a project is under way, OBEX coordinates the work by circulating current versions of data, spreadsheet models, and word processing documents.

At the individual level, InfoCentral integrates your documents and communications with a personal information manager, giving you quick access to a richly cross-referenced set of hierarchical lists of people, tasks, phone calls, contacts, or whatever you want. Between these lists, you establish connections, which are then reflected in an outline. When you enter a task such as a future phone call, meeting, or other event into your list, it shows up on your calendar on the specified date. When you export

Perfect Synergy

PerfectOffice application integration includes:

- **consistent tool bars, drop-down menus, and dialog boxes**
- **common tools such as a spelling checker, a thesaurus, and a grammar checker**
- **OLE 2.0 support for drag-and-drop and in-place editing**
- **QuickTasks for common automation functions such as correct, format, and find**
- **the ability to create cross-application macros and scripts to unify multiapplication tasks**
- **workgroup publishing via Envoy to view, annotate, and distribute documents**

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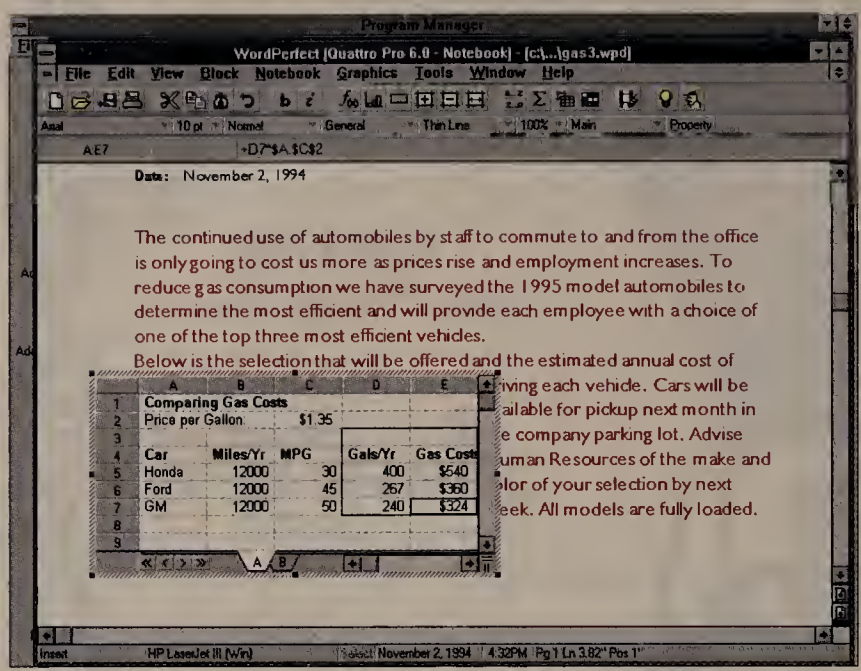


...THE QUATTRO PRO MENUS appear, allowing you to edit the spreadsheet from within the WordPerfect document.

your tasks to GroupWise, they show up in your group calendar.

You can also associate application documents or QuickTasks with items in your InfoCentral lists; if you double-click the document name in the list, InfoCentral launches the application and retrieves the document. So instead of organizing your mind to fit the computer, PerfectOffice promises to organize your computer to fit your mind. Working from personalized lists of people, events, projects, and so on, you can organize documents, messages, memos, and phone calls into handy packages; when there's something you need to do, it appears on your calendar; when you need to meet with someone else, the system notifies that person via E-mail and coordinates your schedules.

Want to create a complex, OLE-sophisticated compound document? Just click a button, and PerfectOffice takes care of launching the apps, storing the document you-care-not-where. To set up a customized, multi-app task for you and your workgroup, just start the QuickTasks recorder, bang away for a while, and assign the task to an icon on the DAD.

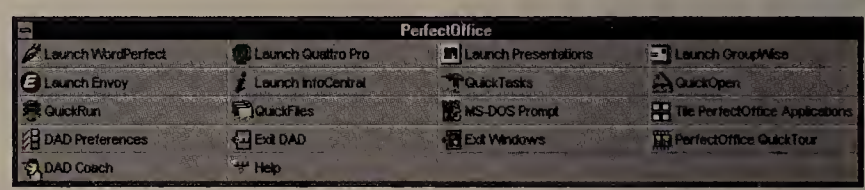
A Dose of Reality

While Novell's vision obscures the demons lurking in the details, there are a lot of devilish details to be exorcised in engineering a vision of this scope.

One of Novell's key challenges was to integrate a set of applications that were originally created as separate entities. PerfectOffice includes Quattro Pro 6.0, WordPerfect 6.1, WordPerfect Presentations 3.0, Envoy 1.0 (a document viewer and packager), InfoCentral, GroupWise, and DAD.

Another major task was to get Quattro Pro functioning as a WordPerfect-style application; and at the look-and-feel level, Novell has made a lot of progress, building on efforts that began well before the takeover. Quattro's menu structure has been altered to be more consistent with WordPerfect's style. WordPerfect's stellar versions of the File Open and File Save dialog boxes have been grafted in, giving you complete control over your files and directories. Quattro now displays tool bars one at a time, and they've been redesigned to be consistent with WordPerfect's. A context-sensitive property band, similar to the live status bar in Lotus SmartSuite applications, gives instant access to the most frequently used selection lists: fonts, borders, and zoom levels.

Quattro Pro 6.0 has also gained some significant improvements. To mention just a few: Customizable speed formats let you set up your own



THE DESKTOP APPLICATION DIRECTOR, DAD for short, is your command center. Launch apps and commonly used tasks from here.

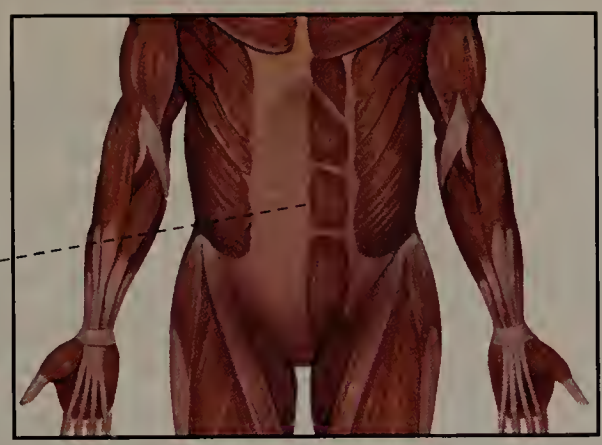
Clean Out Old Applications:

It wasn't long ago that MicroHelp's UnInstaller was the only utility on the market that deleted unwanted Windows programs. But the product's well-deserved popularity has led to a bumper crop of competitors, including the latest utility from Vertisoft Systems: Remove-It.

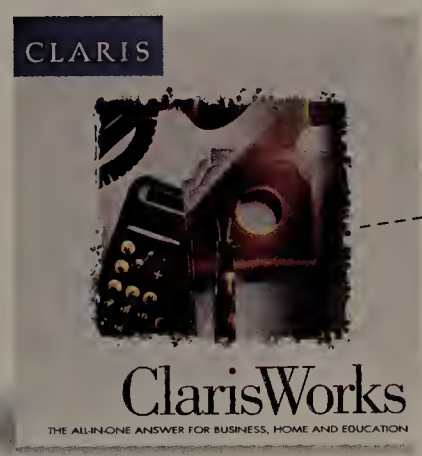
Like UnInstaller, Remove-It provides essential functions by deleting unwanted Windows applications and references to them in INI files. But Remove-It goes one step further by deleting DOS apps, too. It also finds and deletes stray files left from prior uninstalls, and it zaps duplicate files and unused fonts and drivers. It even lets you view files before deleting them.

One of Remove-It's biggest advantages is its user interface. Novices will appreciate the large, easy-to-understand icons and the text descriptions of each tool. Some icons are also animated, lending a whimsical touch to the program. For instance, the Reference Card icon changes from a blinking eye to a video camera. By comparison, UnInstaller's user interface is somewhat drab; its small icon set is hard to understand, and beginners will likely have to rummage through the program's drop-down menus to find the right tool.

Remove-It has other helpful features, including a Watch-It utility that works in the background to monitor file usage. Watch-It creates a statistical report on the average use of each file over a 30-day period; you can then delete seldom-used files. The $69.95 Remove-It also lets you back up applications to a floppy or hard disk and reinstall them later. Vertisoft Systems, Inc.; 800/466-5875, 803/295-5875 Canada, 800/466-4719 (fax). Reader service no. 784



Guts.



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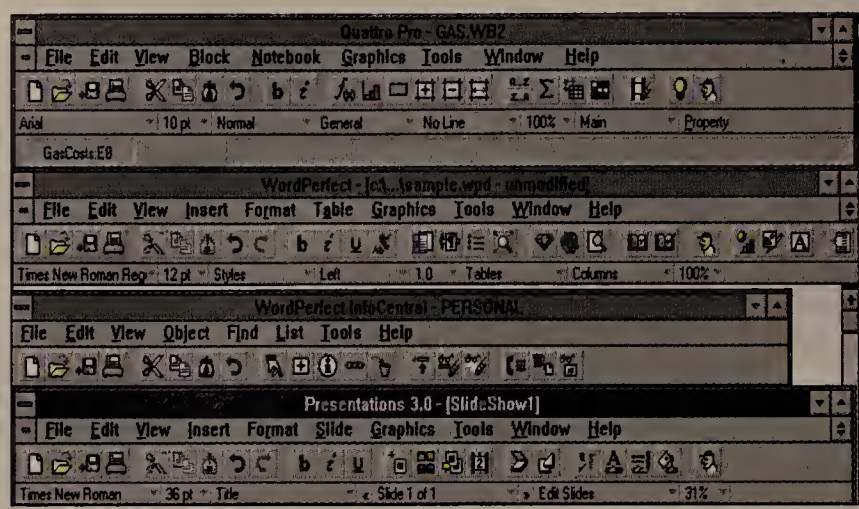

INTEGRATION IN PERFECTOFFICE starts with a uniform approach to the interface, with common tool bars and icons.

automatic formatting scheme; you can edit a graph without making a trip to the graphics page of the workbook; like 1-2-3 and Excel, the spreadsheet now has a drawing layer for annotations; and a new Formula Composer helps you build error-free complex formulas.

But the differences between Quattro and the other applications still run deep, and users will have to learn different procedures for certain tasks in Quattro than they will for the rest of the apps in the suite. For example, customizing WordPerfect's or Presentations' tool bars is a simple drag-and-drop affair, but because Quattro's custom tool bars are really a subspecies of its custom dialog boxes, creating one is a different process.

Share and Share Alike

Another laudable idea in PerfectOffice is to provide a core set of tools available throughout the suite. Though this scheme is still incomplete, the resulting degree of integration will exceed that available in Lotus SmartSuite or Microsoft Office. For example, QuickCorrect, an on-the-fly spelling checker similar to the one in Word, is available in all the applications except Quattro. When you use OLE to insert a chart into a WordPerfect document, the chart engine comes from Presentations rather than from a separate charting applet (as it does in Office). All applications provide access to OBEX and E-mail for sharing and routing.

To explain all the new features, each app offers Borland's excellent Coaches, tutorials that direct you through a procedure as you work on your own tasks; and Experts, sequences of dialog boxes that step you through a complex process.

To let you build those complicated-looking fancy compound documents, all the apps are OLE 2.0 clients and servers (except InfoCentral, which is a client only). So, for instance, you can drag and drop to embed a Quattro graph in a Presentations document. When you double-click the graph later from within Presentations, the Quattro graph menus appear so you can edit it in situ. But here again, the incomplete details will bedevil users attempting to get to the data. While you can edit and annotate the Quattro graph in place, your view of the spreadsheet is restricted to the graph editor only; without access to the spreadsheet grid, you can't change the embedded numbers.

In short, PerfectOffice 3.0 has come a long way. Much more than a bunch of applications stuffed into one box, it's a coherent vision of how users' desktops might function in the future, and it's a compelling one. Now, if Novell can just get all those details right.

—Richard Scoville

PerfectOffice 3.0

The best integration we've seen yet in suite products, with the latest versions of WordPerfect, Quattro Pro, and Presentations.
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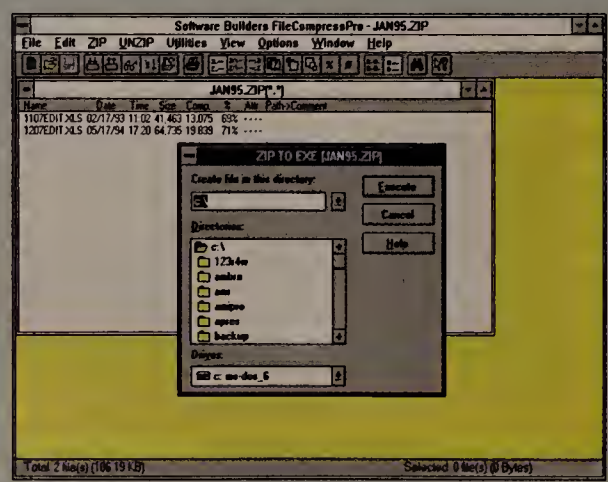
Add Zip to Windows:

Anyone who's downloaded files from an online service will appreciate Software Builders' FileCompressPro, a powerful, easy-to-use Windows utility for compressing, decompressing, and managing files in the ZIP compression format.

FileCompressPro, which appears as a menu in File Manager, lets you compress and decompress ZIP files from inside Windows. Using the familiar icon-driven interface of a Windows program beats struggling with the cryptic, switch-ridden interface of PKWare's PKZip and PKUnzip.

The $59.95 FileCompressPro offers some powerful features. A self-extraction function lets you convert ZIP files to EXE files, which decompress themselves when a user invokes them from either Windows or DOS. This feature is useful when you send files to colleagues who may not have a decompression utility. The self-extracting EXE component adds about 15K to the size of the original ZIP file, so you'll want to use it only with larger files.

FileCompressPro's file viewer allows you to view, but not edit, the contents of ZIP files in common formats, whether or not you have the application that created them. The Span Disk feature—useful for backing up a hard disk—enables you to create an archive of compressed files that can span more than one floppy disk.



Our only real beef with FileCompressPro is its price. WinZip 5.5 from Nico Mak Computing (800/242-4775) offers basic compression and decompression features for $29. But if you need the extras, consider forking out for FileCompressPro. If you spend lots of time online or exchanging large files, either of these programs is a must. Software Builders, 800/432-0025. Reader service no. 792

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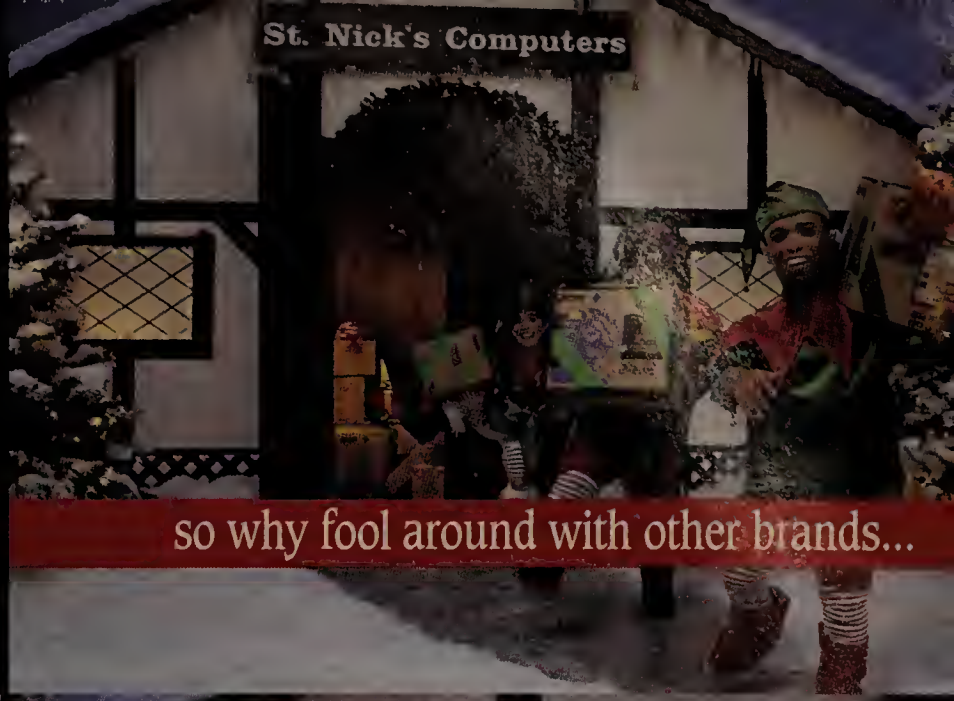

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- MS-DOS® 6.2, Microsoft® Windows™ 3.1, MS Productivity Pack, Epic™ Pinball

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AcerPower™ puts up to twice the power of a desktop system in a notebook computer. With the lightning-fast IntelDX4 processor running at 75MHz, your productivity will reach new heights. After all, if you're busy enough to need a notebook, you sure don't have time to sit and watch the hourglass.

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Credit card-sized PCMCIA cards slide into any AcerNote, adding more memory and let you tap into your network, sen information to a fax machine via modem access additional storage device or transfer data between your laptop and office desktop. PCMCIA cards also make great stocking-stuffers!

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Convenient, upgradable architecture has arrived with the AcerNote 780cx. It features a revolutionary modular design that makes upgrading components and servicing easy. That's important, because when you're traveling with your notebook, your system administrator won't be around to help you.

Expandability For Tomorrow, Power For Today

The AcerNote 760 series gives you all the expandability of the 780cx, plus more power than many current desktop PCs. The high performance of the Intel 486DX2/50MHz processor, combined with local bus architecture, gives you the power to take all your projects on the road with you, not just the less-demanding ones.

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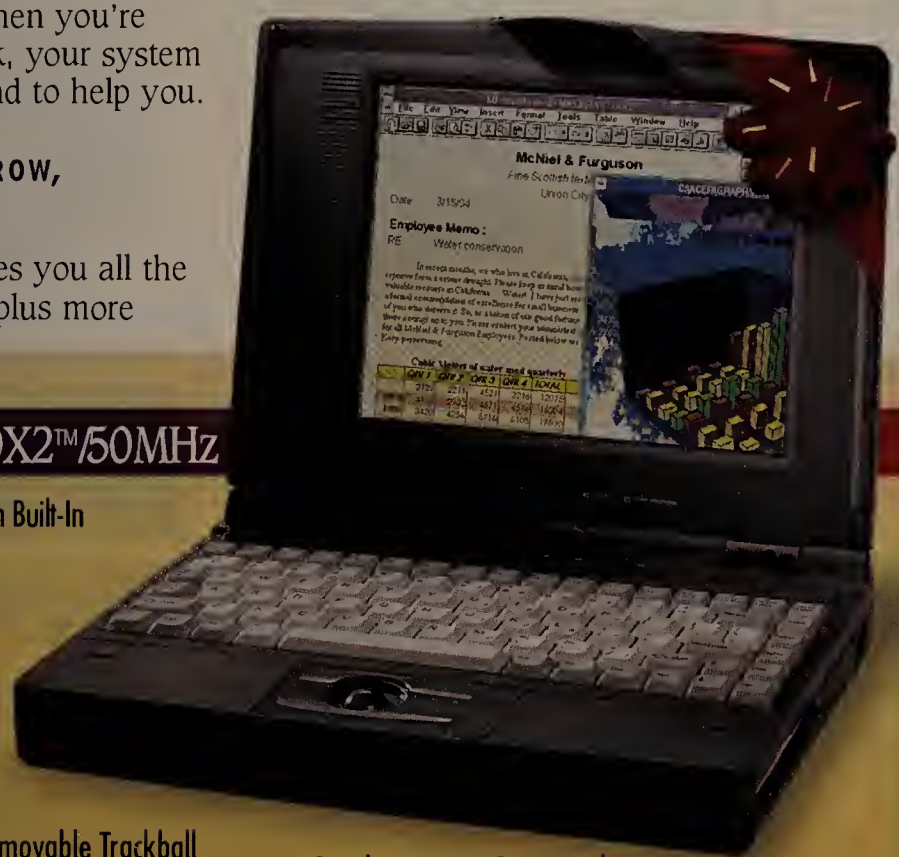

AcerNote 760cx i486DX2™/50MHz

- i486DX2/50MHz Processor With Built-In 8KB Cache
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- Easy-to-Remove Keyboard
- EasyTrac Centrally Located Removable Trackball
- 2 PCMCIA Type II Slots/1 Type III Slot
- 1.44MB Diskette Drive
- Local Bus Accelerated Graphics
- Suspend-to-Disk Feature, "No-Reboot" CMOS Setup and Suspend-Resume Hot Button
- 9.5" Active-Matrix LCD Displays 256 Colors
- Simultaneous LCD/CRT Display
- Slim 8.66" x 11.4" x 2.1" Case Weighs 6.4 lbs, Including NiMH Battery Pack
- Graphic Battery Gauge Indicates Remaining Battery Life
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- 1.44MB Diskette Drive
- Local Bus Accelerated Graphics
- Suspend-to-Disk Feature, "No-Reboot" CMOS Setup and Suspend-Resume Hot Button Preserve Battery Life
- 9.5" Dual-Scan LCD Displays up to 256 Colors
- Simultaneous LCD/CRT display
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- **Bundled with 14.4 PCMCIA Data/Fax Modem**

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- 1.44MB Diskette Drive
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Deck the halls with PC Power

AcerPower Pentium/90MHz

With AcerPower Pentium processor workstations, you'll have plenty of horsepower for today's CPU-intensive jobs. Business executives choose Pentium processors for database analysis, high-level spreadsheeting, forecasts and analysis. Design and graphic arts professionals swear by Pentium processors for full-color graphic display and processing, 3-D modeling, and design...all without long waits with the "hourglass."

- Intel Pentium/90MHz Processor
- 8MB System RAM (Expandable to 128MB)
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- 15" .28 Noninterlaced Flat Screen Digital SVGA Color Monitor
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- 1 Combination PCI/ISA Slot
- Microsoft® Windows™ for Workgroups, MS-DOS 6.2, Productivity/ Entertainment Packs, Works for Windows™ and Quicken®

intel inside pentium PROCESSOR

$2,595

1194DIR06

A Powerful Choice For Home Or Office

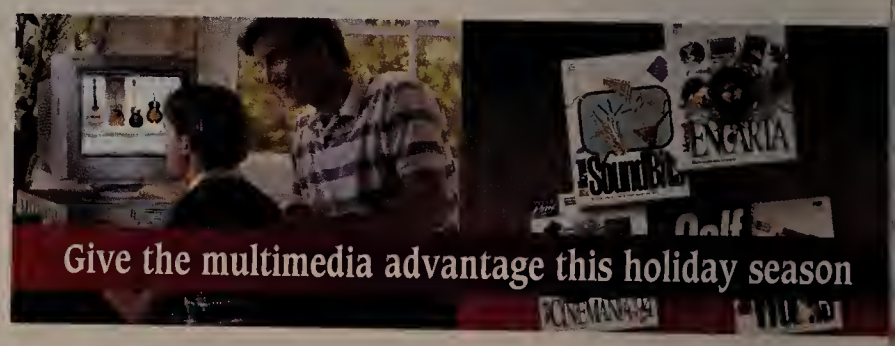
A desktop system for your home or small office would be nice, but the price has to be right, and it's got to have some computing power. Now, just in time for the holidays, comes the AcerPower series of desktop and minitower PCs. They're out-of-the-box performers that leave as much room for future expansion as they leave leftover cash in your gift fund.

An AcerPower For Every Price Range

AcerPower™ incorporates a full range of systems, from value-priced desktop models to higher-end, super-powered minitowers that admirably serve the most power-hungry business applications. And there's a price point that can provide even the biggest Scrooge with a basic system that can be expanded as business grows and resources allow. Start with an i486DX2/66MHz processor-equipped AcerPower built for productivity. Or opt for a Pentium-powered desktop tower that tears through number-crunching and multitasking jobs with ease.

Multimedia Upgrade Kit

Make your AcerPower a family multimedi



Give the multimedia advantage this holiday season

station with this special multimedia upgrad kit. It augments the standard CD-ROM drive with a Sound Blaster- and Business Audio-compatible 16-bit sound card, high-performance stereo speakers and Microsof multimedia bundle with Works, Encarta,™ Golf, Cinemania™ and SoundBits.™

Join the Pentium multimedia revolution

AcerPower Pentium/90MHz

- Intel Pentium/90MHz Processor
- 16MB System RAM (Expandable to 128MB)
- 256KB Second-Level Cache
- 1GB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- **Quad-Speed CD-ROM Drive**
- 15" .28 Noninterlaced Flat Screen Digital SVGA Color Monitor
- 1MB 64-Bit PCI Nitro Windows Accelerator Card
- 1.44MB Diskette Drive
- 2 PCI 32-Bit Expansion Slots
- 4 ISA 16-Bit Expansion Slots
- 1 Combination PCI/ISA Slot
- Microsoft Windows for Workgroups, MS-DOS 6.2, Productivity/ Entertainment Packs, Works for Windows and Quicken

$2,995

Business Leasing Available

1194DIR09

Santa's Power Station

AcerPower Pentium/90MHz

- Intel Pentium/90MHz Processor
- 16MB System RAM (Expandable to 128MB)
- 256KB Second-Level Cache
- 1GB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- **Quad-Speed CD-ROM Drive**
- 15" .28 Noninterlaced Flat Screen Digital SVGA Color Monitor
- 2MB 32-Bit PCI **ATI Mach 64** Windows Accelerator Card
- 1.44MB Diskette Drive
- 2 PCI 32-Bit Expansion Slots
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Business Leasing Available

1294DIR20

The Ultimate Gift

AcerPower Pentium/90MHz

- Intel Pentium/90MHz Processor
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- 256KB Second-Level Cache
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- **Quad-Speed CD-ROM Drive**
- 17" .28 Noninterlaced Flat Screen Digital SVGA Color Monitor
- 2MB 64-Bit PCI **ATI Mach 64** Windows Accelerator Card
- 1.44MB Diskette Drive
- 2 PCI 32-Bit Expansion Slots
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Business Leasing Available

1194DIR11

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Multimedia Upgrade Kit

Make the most of the new Acer CD-ROM standard with this special multimedia upgrade kit that includes: Sound Blaster™- and Business Audio-compatible 16-bit sound card; high-performance stereo speakers; Microsoft multimedia bundle with Works, Encarta,™ Golf, Cinemania™ and SoundBits.™

$150

Available with system purchase only

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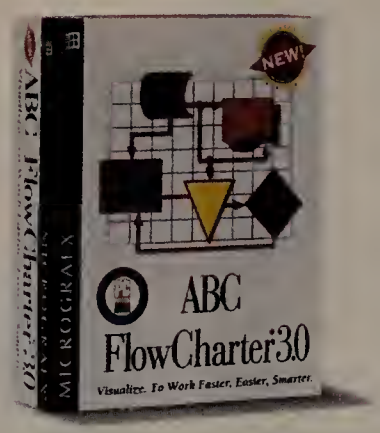

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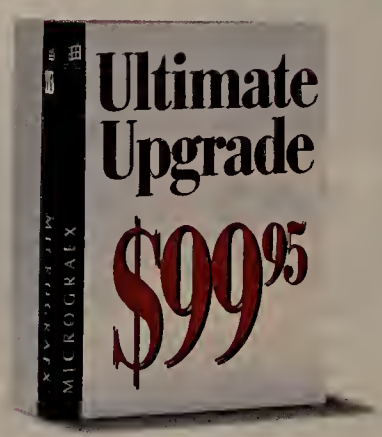

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Panasonic V41: Lights, Action, Roll 'Em

Want to really wow your clients with a full-on multimedia sales pitch? Get a local-bus PC with a superfast processor and a nice big color monitor. Fill it up with plenty of RAM, a huge hard disk, 16-bit sound, and a dual-speed CD-ROM drive for full-motion video. Pack it all on a dolly and roll it into your client's office.

Or get a Panasonic V41 Multimedia Notebook. It weighs only about 8 pounds, and compared to a state-of-the-art desktop it has everything but the inconvenience. The V41 note's 100-MHz Intel DX4 CPU and VESA local bus video adapter, backed by 1MB of VRAM, have the necessary oomph to splash killer sales pitches across the big 10.4-inch active-matrix color LCD screen. Both its 450MB Enhanced IDE hard drive and its full-size on-board CD-ROM drive ride the local bus for faster performance.

On the other hand, if you're on a tight budget or don't really need all that speed and storage, you can get a much cheaper version of the V41 with a 10.4-inch passive color display, a very respectable Intel 486DX2-50 processor, and a 260MB hard drive for about $2600 less than the high-end $6599 configuration. Similarly, Panasonic plans to expand the line in an upscale direction: It'll produce a notebook that uses Intel's new 75-MHz Pentium, once the chip is available in volume.

The V41 has room for plenty of RAM. You get a minimum of 4MB on the 50-MHz DX2 model, but that doesn't really make much sense in this era of RAM-gobbling graphical apps. If you start with the standard 8MB on the DX4 system, you can expand up to 24MB. Or you can start with 16MB and grow to 32MB—plenty of room for Windows 95 and jumbo 32-bit applications next year.

Take a Spin

The dual-speed CD-ROM drive is, of course, this portable's most outstanding feature. It has an average access time of 330ms and a storage capacity of 540MB, and it's compatible with Kodak Photo CDs and both 5¼-inch and 3½-inch CD-ROMs. Given the many applications that crowd a hard drive these days, an integrated CD-ROM drive can come in handy for the huge multimedia files you'll use for presentations.

A 16-bit sound chip and a pair of integrated speakers complement your multimedia setup. You can mix video clips into your desktop presentation or take along a homegrown CD-ROM of every nut and screw in your company's product line. In addition to DOS and Windows, the V41 is equipped with the software utilities you need for mixing sound files and playing audio discs or multisession Photo CDs. The speakers really kick out the sound, but you'll probably want to add a pair of the larger external speakers in order to get the fullest benefit from the ESS chip's high-quality 44.1-kHz audio sampling.

THE 8-POUND V41 HAS an internal CD-ROM drive and stereo sound.

The fact that all of this fits in a portable with an average 9.3-by-11.7-inch notebook footprint and a low-slung 2.25-inch profile is a small miracle of design. Panasonic pulls it off by hiding the CD-ROM tray under a lift-up keyboard; your discs spin securely in the notebook's body, and there's enough room for a spare disc.

And the V41's keyboard isn't bad, either. It has a good standard layout, full-size keys with 3mm of travel, and just the right clickety-clack. While the V41 could use an eraserhead pointer and a wrist rest—similar to those found on the IBM ThinkPad or the Toshiba Portégé—the next best solution is Panasonic's front-and-center trackball and mouse buttons, which are positioned conveniently below your thumbs as you type.

The rest of the fit and finish is equally impressive. The V41 notebook is as sleek as a three-piece Brooks Brothers suit, and you'll be proud to set out its textured magnesium case before a client. But it's also very rugged, with about 20 times the strength of most plastic cases, says Panasonic.

The V41 is decked out with almost every special feature available for portables, including speaker and line-out jacks for multimedia peripherals. There's also a PCMCIA Type III slot that holds two Type II peripherals or a single Type III hard drive. The V41 even borrows a trick from the NEC Versa and lets you double your battery life by swapping out the floppy drive for a spare ($279) NiMH battery.

In brief, this is the best multimedia presentation platform you can carry into a client's office without a dolly. At the very least, the V41 notebook would be a great stereo CD player for your hotel room.

—Jeannie Matsumoto

V41 Multimedia Notebook

Sleek, powerful notebook packed with multimedia features.
Panasonic
800/742-8086
Street price: $6599 in high-end configuration
Reader service no. 739

Lexmark's Optra Printers: 1200-dpi Output at a 600-dpi Price

For about the price you'd pay for a run-of-the-mill network laser printer with 600-dpi resolution and PostScript capability, you can buy a Lexmark network laser with resolution up to 1200 dpi. Lexmark's new Optra laser printers let you choose between 1200-by-1200-dpi mode for top-quality graphics and 600-dpi mode for faster performance.

The Optra series' 1200-dpi performance promises great-looking graphics—and these printers are also very affordable. Consider this: Lexmark's Optra R, a 12-page-per-minute (ppm) model with 2MB of RAM and PostScript Level 2, is expected to sell on the street for approximately $1400.

Like Hewlett-Packard, Lexmark has developed its own compression technology that allows PostScript in printers that have just 2MB of RAM. However, Lexmark recommends an additional 8MB of memory for printing scanned images or line art at 1200 dpi. The additional RAM costs between $400 and $450, boosting the Optra R's street price to about $1800.

By comparison, HP doesn't currently offer a 1200-by-1200-dpi laser. The closest HP competitor is the 600-dpi 4M Plus, a 12-ppm laser with PostScript and 6MB of RAM that costs $1923 on the street.

Lexmark Optra Network Printers

Network laser printers with 1200-dpi resolution.
Lexmark Int'l
800/891-0331
List price: $1749 to $3699
Reader service no. 740

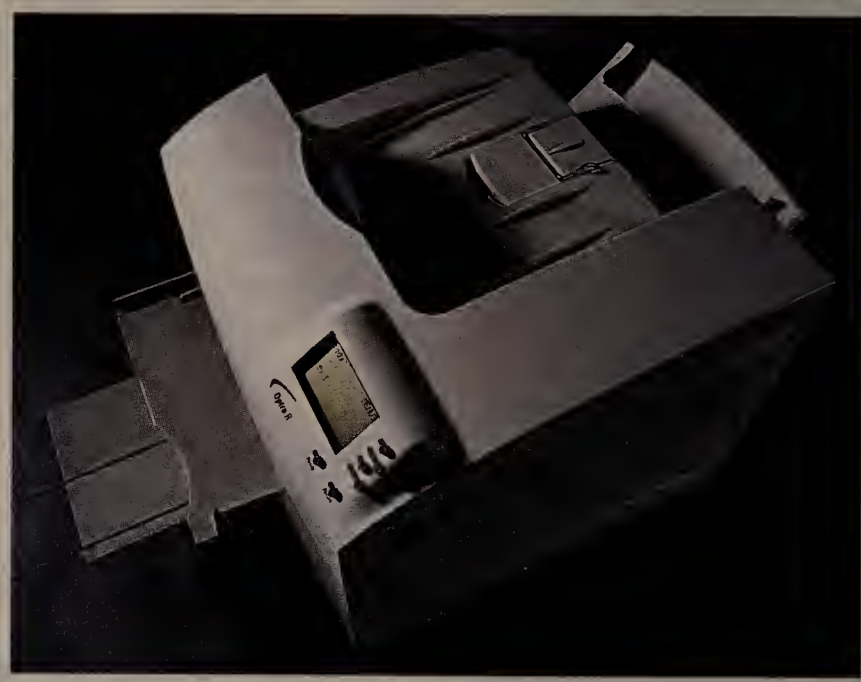
You'll probably choose the Optras' 600-dpi mode for text jobs, since it's faster and since there's virtually no difference in text quality between 1200 dpi and 600 dpi. But for graphics, the quality of 1200-dpi mode is hard to argue. Scanned images printed at 1200 dpi, particularly images of people, look noticeably better than their 600-dpi counterparts. The Optras print 12 to 16 ppm at 600 dpi, depending on the model, and 8 ppm at 1200 dpi.

All Optra printers come standard not only with PostScript, but also with PCL5e emulation and Lexmark's MarkVision software, which allows bidirectional communication between the printer and your networked PC—a useful tool for configuring and troubleshooting.

The Optra R has four siblings. The Optra Rx, a 16-ppm model with 4MB of RAM, sells for under $2000. The Optra L models are high-end LAN printers. The Optra L, a 12-ppm unit with 4MB of RAM and a 500-sheet tray, costs about $1900. The Lx, a 16-ppm unit with 4MB of RAM, is priced between $2400 and $2500. At the top of the line, the $3000 Lxi offers 16 ppm, 8MB of RAM, a second 500-sheet paper tray, and an integrated ethernet adapter for connecting to the office network.

Not only do these printers product high-quality output—they look good, too. Lexmark is one of many hardware vendors paying increasing attention to aesthetics. The Optras sport sleek, streamlined designs quite different from the boxy shapes of Lexmark's previous 4029 and 4039 network lasers.

—Laurianne McLaughlin



OPTRAS' OPTIMUM PRINTING: Lexmark's new Optra series of network lasers features 1200-dpi printing and a sleek, sculpted design.

Matrox Makes a Good Impression

For all the talk about multimedia, the truth is that PCs haven't been up to the task of juggling color images, full-motion video, and complex 3-D graphics. However, Matrox's new MGA Impression Plus graphics board combines fast Windows performance, accelerated 3-D graphics, and vital connections for video playback.

Like other graphics accelerators, the Impression Plus speeds common Windows graphics tasks by processing them on board, freeing the system CPU for other chores. The Impression Plus PCI scored a satisfactory 77.4 in the *PC World* Windows Integrated Test Suite at 1024 by 768 resolution and 8-bit color. The board also excels in 24-bit color mode, providing fast performance and eye-pleasing high refresh rates. (For more reviews of the latest and greatest Windows graphics accelerators, see this issue's *Graphics Boards Top 10* on page 211.)

MGA Impression Plus

Sophisticated graphics board speeds video and 3-D graphics.
Matrox Graphics
800/361-1408
Street price: $375 to $575
Reader service no. 741

The Impression Plus graphics board stands out in its ability to speed 3-D tasks such as object rotation and shading—essential for realistic simulations, games, and virtual reality applications. In addition, the board's VESA Media Channel add-on option lets you connect up to 15 video sources to your PC for real-time tasks such as video conferencing, video training, and the like. The Impression Plus is available in ISA, VL, and PCI bus versions and costs about $375 with 2MB of VRAM, or $575 with 4MB of VRAM.

—Michael Desmond

Twin Power Tower

Dual Pentium™ Processors Make This Workstation A Multitasking Powerhouse.

If you're looking for a workstation that actually does more work, take a good look at our new CP90mp. Its twin 90MHz Pentium™ processors multiply the number of tasks performed by performing them simultaneously!

Consider: A single 90MHz Pentium™ delivers 4 times the speed of a 66MHz/486DX2. So just imagine the power of two! Imagine the productivity gains for CAD/CAM, multimedia and other high-end applications. And imagine EISA and PCI that keep I/O functions zooming along at peak 32-bit speeds!

The amazing CP90mp dual-processing workstation is ready now. But if you're not, you can start with a single processor and add a second later. Your future options will also include using Windows NT Server to configure your CP90mp as a multitasking server!

So don't think twice. Put the twin power tower to work for you now!

CP90mp Tower

- ***Two Intel 90MHz Pentium™ Processors in ZIF (Zero Insertion Force) sockets***
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- ***Dual Speed CD ROM Drive; Quad Speed Optional; MPC2 Compliant***
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Circle 73 on reader service card

The EPSON ActionScanning System gives you creative freedom without creative financing.

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Easy and affordable scanning for the PC is here. It's called the EPSON ActionScanning System. EPSON makes it simple to put text and images in your documents.

With 600 dpi and 24-bit color, the ActionScanning System captures crisp, clear images. Great results are easy to achieve with EPSON's exclusive built-in controls.

The ActionScanning System comes with everything you need for productive scanning, including top-ranked image editing software Picture Publisher 4.0 LE, TextBridge OCR, interface board and cable, and a TWAIN driver for software compatibility.

All this makes the ActionScanning System ideal for your home or office. Considering that the entire system is available under $699, buying an ActionScanning System is as easy as using one. To see how far your creativity can go, visit your local authorized dealer or call the phone number below.

EPSON

1-800-BUY-EPSON
Ext. 3550

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Data Link: Buck Rogers Meets Bill Gates

Timex's Data Link Watch is a timepiece for the warp-speed generation. This was the type of wristwatch that movie matinee heroes Flash Gordon and Buck Rogers used against Ming the Merciless and a host of other villainous warlords 50 years ago. Today, this wrist-based information manager is a practical tool to help mobile warriors keep track of appointments, errands, anniversaries, and phone numbers.

LOOK, MA—NO WIRES: Timex's $130 Data Link Watch uses an infrared signal to receive data from a Windows-based PIM.

The $130 Data Link Watch uses an infrared signal to receive data from your desktop PC's monitor. (However, it does not work with the LCD screens of notebooks.) Data Link is bundled with Microsoft's and Timex's Data Link software and a personal time manager, and it accepts appointments and to-do information from Microsoft's Scheduler Plus.

Using the Microsoft software on my desktop PC, I entered six phone numbers that I use frequently but can't remember. Then I added those upcoming birthdays that I always forget.

Then it was time to download all this data to my watch (look, Ma—no wires, no cables). I set the watch to COMM mode, clicked Send to Watch, and held the watch face about a foot from the screen. A series of beeps signaled that my watch was reading the data. Sure enough, my six appointments, seven phone numbers, five to-dos, and three anniversaries popped up on the watch face when I clicked a button on the side of the watch.

Since the Data Link doesn't read data from LCD screens, I'm chained to the desk for new uploads—unless I can find a CRT to plug into the back of my notebook.

—Michael S. Lasky

Timex Data Link Watch

Digital watch receives desktop data remotely.
Timex Corp.
800/367-8463
Price: $130
Reader service no. 742

The Jet-Set Modem Kit for International Travelers

While world leaders declare the need for unity among nations, international road warriors know that the global village is a long way off. Just try to use your notebook computer's modem in any country outside the United States, and you'll know what I mean.

Each country has its own telecommunications standard, creating a high-tech Tower of Babel. Although many countries use the RJ-11 modular phone connector, U.S. business travelers abroad often discover they're unable to connect their modems to the local phone system. Either the phone plug is a different size or shape, or the local system uses pulse instead of touch-tone dialing.

The $104.99 Executive TeleKit is a tough, lightweight vinyl bag filled with telecommunications tools to help solve this dilemma. TeleClips, a standard RJ-11 phone plug that's attached to a pair of alligator clips, lets you connect your modem to a phone receiver. TeleDaptors is a set of some 40 or so customized foreign telephone plugs. And TeleTester is a device that determines whether you have a good phone connection—simply attach TeleTester to TeleClips; a green light indicates that the line is working. You also get a set of miniscrewdrivers to remove wall covers and examine wiring.

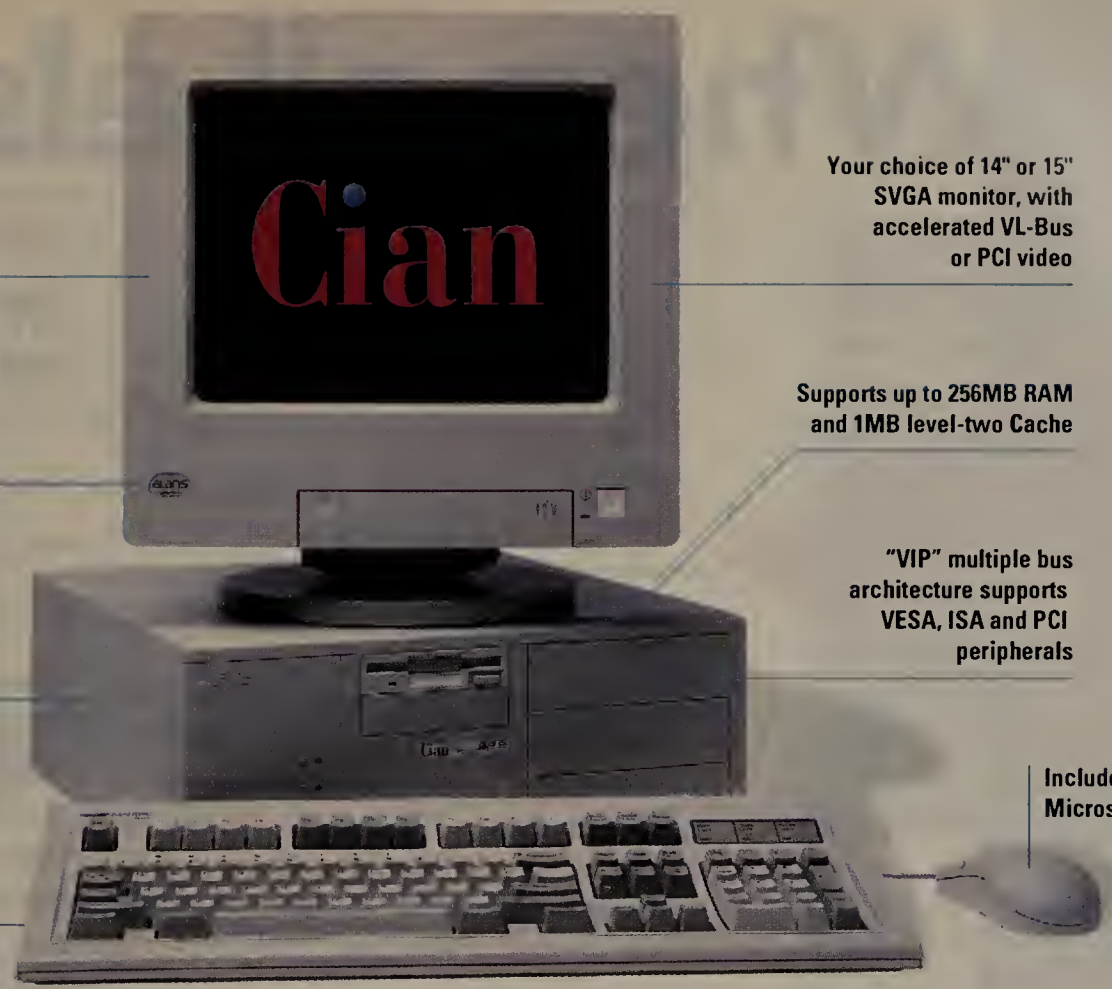
The bag also holds a collapsible pocket phone and a tone dialer that converts any pulse phone to the tones you need for voice mail and other computerized functions. There's even a custom flashlight that rests on the floor at a 90-degree angle—useful for removing the phone's wall bracket in that hard-to-reach location.

—Michael S. Lasky

Executive TeleKit

Handy tools for phone and modem connections in foreign countries.
TeleAdapt Inc.
408/370-5105
List price: $104.99
Reader service no. 743

INTERNATIONAL ROAD WARRIOR: Executive TeleKit has a variety of foreign phone plugs.



EnergySmartPC™'s are fully EnergyStar™ compliant

The Alaris™ logo is your guarantee of Made in the U.S.A. quality!

Supports Intel®, IBM®, Cyrix®, AMD® and NexGen™, Microprocessors

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Cian systems are compatible with Intel's 486 SX, SX2, DX, DX2, and DX4, as well as the Pentium™ P24T and 64-bit P54C processors. They also accommodate Cyrix's 486, AMD's 486, NexGen's Nx586, and IBM's Blue Lightning processors. Support for PowerPC, Cyrix's M1 and AMD's K5 will also be available.

Part of the secret to Cian's processor upgradability is its PowerPath™ plug-in processor modules which preserve your original motherboard. They plug directly into the motherboard and make upgrading from a 486 to 586 quick and easy!

PowerPath™ Modules

Cian's PowerPath plug-in processor modules allow you to upgrade to the CPU you want, when you want it!

In addition, service and support are greatly enhanced due to the commonality of parts. Using one motherboard as a base platform makes upgrading and servicing faster, easier, and less expensive.

Cian PCs from Alaris are the first systems that let you preserve your hardware investment and take advantage of the latest in processor technology. They give you more room to grow, and something no other PC can offer -- "freedom of choice". For the first time ever, you are free to choose the processor you want, when you want it, and from whom you want it. Set yourself free and call us at 1-800-317-2348 for more information.

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Circle 20 on reader service card

When all else fails

Starting at
$119

There are three types of computer users: those who have lost data due to a power problem, those who are going to, and those who have protected themselves against the inevitable surge, blackout or brownout with the most reliable UPS they can buy: Back-UPS by APC. In fact, editors and users alike agree that if your system demands absolute reliability, you can depend on APC Back-UPS.

According to a study by Bell Labs, undervoltages represent the overwhelming majority of power problems likely to hit your computer. The question is not if a failure will occur, but when. Whether due to construction, wiring, weather, other office equipment, or accidents, power problem are as inevitable as death and taxes. That' why you need instantaneous battery backup power from the Back-UPS to prevent data loss, hard disk crashes, and hard ware damage.

If you're concerned about lightning rest assured that when measured using the ANSI/IEEE 587 Category A test wave Back-UPS are superior to virtually al separate surge suppressors. Surge performance is even backed by a $25,000 Lifetime Equipment Protection Guarantee.

APC Voted most reliable by 3-to-1
Tripp [redacted]
Best [redacted]

PC MAGAZINE

In a recent poll by PC Magazine's *MagNet, APC was voted the most reliable UPS manufacturer by a 3-to-1 margin. That's dependability that will see you though years of unmatched power protection.*

PC MAGAZINE UK EDITORS' CHOICE

"The clear winner in price performance...it's unbeatable..."

August 1993
APC Back UPS 1250

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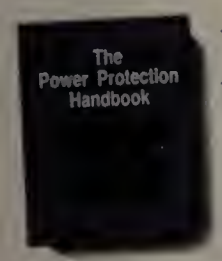

Free Power Solutions Handbook

What are the myths and musts of PC protection? What are the 10 most common power protection mistakes? The top tips for adding reliability to your LAN? Get your FREE copy and find out!

☐ **YES!** I'm interested in trading up a competitive or older UPS to a Back-UPS. Please send Trade-UPS info.

☐ **No!** But I would like a FREE Handbook.

Name _____ Title: _____

Company _____

Street/City/State _____

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Phone/fax: _____

Brands of UPS used? _____ # servers/PCs to be protected? _____

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Company _____

Address _____

City _____

State _____ Zip _____

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P3

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West Kingston, RI 02892-9920

Back-UPS® prevail

Attention Resellers, Win $10,000 cash in APC's Back-UPS Workstation Success Story Promo!! Call for an entry form today!

"All other brands of UPS die regularly in this lightning prone environment. My APC won't die!" said Paul Sisilli, Systems Analyst, City of Port St. Lucie. "With other brands, users don't find out until it is too late. The power interruptions here are very hard to live with. The other brands are dying off. Typically they last just beyond their warranty period. My Back-UPS is going on three years...no other brand is as reliable."

Don Truax knows first hand about Back-UPS reliability: "It ought to be against the law to buy a computer without an APC Back-UPS 250. I recently had a direct lightning hit right outside the house...my computer never blinked. Each morning I get a surge down the line and both APC's hate it - they simultaneously 'holler 'n clamp' while my 'Brand T' quietly sleeps in. I've relegated that unit to non-critical household stuff like my VCR."

Andrew Wargo, Manager at Baxter Land Company, tried two other brands before Back-UPS. "One lasted a few days, a second one went up in smoke after 48 hours, a third lasted less than 24 hours! I then bought my Back-UPS for less than half of what I had paid for the others. We've purchased three more Back-UPS and for the past 14 months they've been just hummin' away on the same power line that was eating the other brands alive!"

If you're protecting a network server, a communications interface port (on models Back-UPS 400 and higher) provides the security of an automatic shutdown to all major OS including NetWare, Windows, Windows NT, LAN Server, LAN Manager, LANtastic, SCO Unix, OS/2, Banyan Vines, AppleShare/System7 and more, so your data is safe whether the system is attended or not. (PowerChute software and interface kits sold separately.)

And since data processed on networked clients needs protection too, the $139 Back-UPS 280 provides an economical solution for all your LAN workstations. And if you have a new green PC, the price is even better at $119 for the new Back-UPS 200.

MADE IN

Discovering how essential Back-UPS protection is can be hard...if you wait for the next storm to roll through. But discovering how affordable it has become is easy...

Call today and find out (the easy way) why more than 2,000,000 satisfied users bank on Back-UPS from APC. With more awards than all other brands combined, field-proven reliability, and a two year warranty, Back-UPS are power protection you can purchase with confidence.

Back-UPS (L to R)	Application	Sugg. List
200	Green PCs, small desktop systems	$119
280	Desktop systems, LAN nodes, POS	$139
400	Desktop 486, 386 systems, servers	$229
450	Tower 486, 386 systems, servers	$279
600	Heavily configured systems, CAD/CAM workstations	$399
900	Multiple systems, longer runtime applications	$599
1250	Multiple systems, LAN hubs, small minis, telecom equipment	$799

More than... 2,000,000 Satisfied Users

APC has won more awards for performance and reliability than all other UPS vendors combined...including five consecutive LAN Times *Readers Choice awards...*

PC World Top 20 Upgrade · Windows Mag. Readers Choice · LAN TIMES Readers Choice 1994 · Computer Reseller News Editors' Choice

AWARD-WINNING FEATURES

Instantaneous backup power beats blackouts and brownouts

Unmatched lightning (tested to UL1449) and surge protection for maximum hardware safety

Network-grade line conditioning and EMI/RFI filters prevent glitches

LAN Interface (on Back-UPS 400 and up) provides automatic shutdown to all major OS: Windows, NT, NetWare, LAN Server, LAN Manager, LANtastic, Unix, OS/2, Vines, AppleShare/System7 and more.

Site diagnostics automatically spot missing ground and reversed polarity, two common miswirings which usually require an electrician's visit to diagnose.

Option switches allow you to customize transfer voltage and alarm settings.

Test Switch for ongoing peace of mind.

2 year warranty and full safety approvals including ISO9001.

$25,000 Lifetime Equipment Protection

Hot Swappable, User Replaceable Batteries reduce service time, costs by allowing safe removal and replacement of exhausted batteries, while your system stays running.

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Circle 45 on reader service card

Dept. P3

Lotus Organizer 2.0 Helps Manage Complex Business Tasks

Lotus Organizer 1.*x* was one of the friendliest personal information managers around, but it was never the best choice for managing lots of data or tracking complex tasks. Now with version 2.0, the $149 PIM dons a suit and is ready to get to work downtown.

As with versions 1.0 and 1.1, Organizer 2.0's strength is its clever interface. The program still looks much like a paper Day-Timer, with tabs for jumping between the address book, calendar, notepad, and other modules. You can click a chain icon to create links between addresses and your schedule or to drag unwanted items to the wastebasket and watch them go up in flames.

Version 2.0's improvements are more functional than flashy. For instance, you can now add a bunch of appointments from a single dialog box. You can create custom data filters—to view, say, all addresses in a particular ZIP code, or just meetings that involve your boss—and access your appointments from Organizer's drop-down menus. And you can group appointments, to-do items, and other tasks into categories, making it easier to find related bits of information.

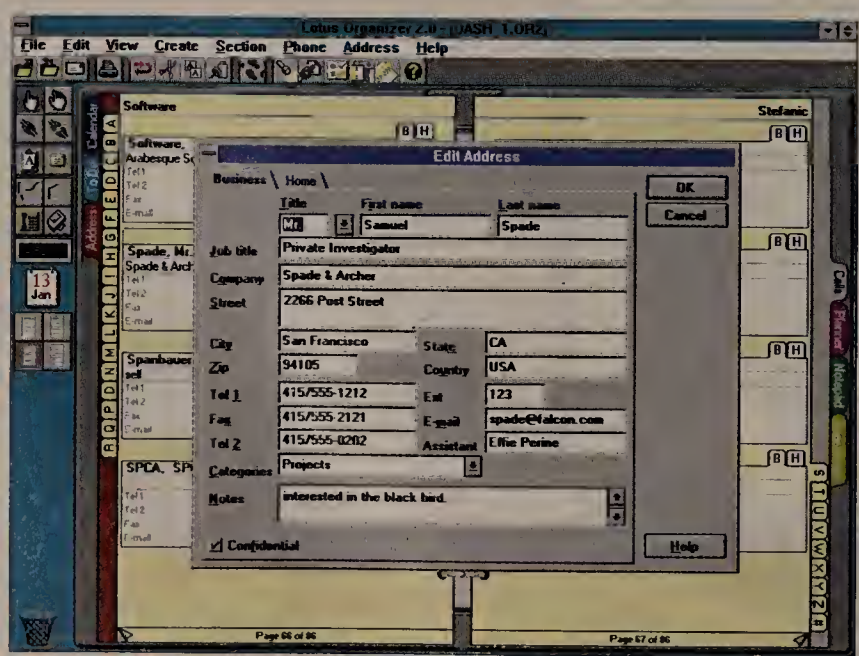
Organizer's calendar also gains some long overdue features. You can now view a month's worth of appointments at once and set up overlapping events—essential if you want to schedule a conference call in the middle of a meeting, for example. Lotus has beefed up version 1.*x*'s anemic address book with a slew of customizable fields as well as separate pages for home and business listings. Version 2.0 also has a new module for logging phone calls, though it's no match for phone utilities in contact managers like Symantec's Act.

Organizer 2.0 has also beefed up version 1.*x*'s feeble to-do list. You can now schedule recurring tasks, specify their deadlines, and set alarms. You can then sort your to-do list in a variety of ways, including by status (current, future, overdue) so you can hide chores away until it's time to worry about them.

But it's 2.0's group scheduling finesse that really makes it a powerful office tool. Organizer now hooks directly into Lotus Notes as well as Lotus cc:Mail, so you can choose meeting attendees from your E-mail address list, send out invitations, and receive confirmations without ever leaving the PIM. You can assign different levels of access to other users on the network, so some colleagues can view your entire schedule, while others can see only your free time. Or you can allow your assistant to access all items in your calendar, address book, and other modules, except for those marked *confidential*.

The downside: Organizer is a bit less flamboyant than it used to be, and it's a touch harder to use. But then, that's the cost of doing business.

—Daniel Tynan



ORGANIZER 2.0's ROOMY ADDRESS BOOK provides separate pages for home and business info and new fields for E-mail addresses.

Lotus Organizer 2.0

Better task management as well as sophisticated group scheduling.
Lotus Corp.
800/343-5414
List price: $149, upgrade $49
Reader service no. 733

Addressing From Windows Apps

PCs have simplified many business chores, but addressing letters and printing envelopes and labels have not been among them. That's where CoStar's AddressMate for Windows can help. This Windows add-in utility for Microsoft Word, WordPerfect, and Ami Pro makes these tasks a little easier.

AddressMate consists of two modules. The address book is a minidatabase that stores up to 8000 names and addresses in a Paradox-compatible format. You can import addresses into your letters one at a time (by typing the person's last name and selecting Retrieve from the AddressMate menu) or en masse for mail merges; AddressMate also imports addresses from existing Paradox, dBASE, or ASCII files. And like other utilities of its kind, AddressMate can locate an address in a letter and automatically send it to your printer.

The second part of AddressMate is a layout module that lets you customize envelopes, labels, or odd-format print jobs—name cards, fax cover sheets, and so on. The program imports all kinds of graphics files, including such popular formats as BMP, PCX, and TIFF.

AddressMate shrinks addresses to fit the labels (without wrapping text), rotates text and graphics, and prints Postnet bar codes for faster delivery.

AddressMate carries a list price of $69.95, but the vendor says it should sell for less than $50 on the street.

—Dan Miller

AddressMate for Windows

Easy addressing from Windows word processors.
CoStar
800/426-7827
List price: $69.95
Reader service no. 734

Comparing Procomm Plus to WinComm PRO? Just make sure you're comfortable with your decision.

Introducing Delrina WinComm PRO™ 1.1. It's the first truly powerful communications software that makes going on-line a pleasure. Instead of a pain.

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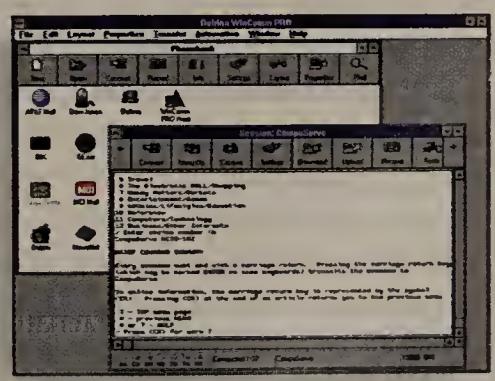

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Best of all, you can get WinComm PRO in the Delrina Communications Suite,™ which also includes Delrina WinFax PRO 4.0, the best-selling, full-featured fax application in the world. Two best-of-breed products for one low price.

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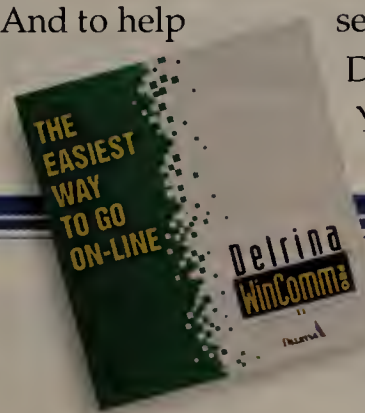

PC Computing MVP FINALIST December 1994

May 30, 1994

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Circle 99 on reader service card

WordPerfect Presentations 3.0: More Tools for Beginners

With the release of WordPerfect's Presentations 3.0, WordPerfect (now Novell's applications division) has taken a clumsy presentation program and brought it up to par with industry leaders Microsoft PowerPoint and Software Publishing Corporation's Harvard Graphics. While Presentations 2.0 had paint and fill tools that were not available in most competing products, it was woefully slow and difficult to use. Version 3.0 zips along and provides a wealth of easy-to-use features.

Most people use a presentation program infrequently—perhaps just once or twice a month. So a strong presentation package needs coaches, templates, and comprehensive online help and tutorials—all the features that make a program easier to learn and relearn.

Presentations 3.0 delivers. When you load the program, the new ShowExpert dialog box helps you select a template that reflects the look and mood of your presentation. Coaches offer context-sensitive instruction, and most screens have Show Me buttons that point to the pertinent menu command or button. Upgrade Expert (which is also new) lists common presentation functions, such as how to create transitions, charts, and bulleted lists; it also has a Do It button that performs the procedure for you.

Other ease-of-use features include balloon help, context-sensitive menus called up by clicking the mouse's right button, menus, and in-place editing of slides. Balloon help identifies menus, buttons, tools, and commands when you point to them with the mouse cursor. Right-mouse-button menus allow you to edit and enhance objects without having to delve deep into the program's menus and dialog boxes.

Presentations now supports OLE 2.0 and shares utilities with other applications in Novell's PerfectOffice suite, such as spelling dictionaries; a thesaurus; a grammar checker; a drawing applet; and QuickCorrect, a utility that automatically corrects typing errors. If you already have PerfectOffice 3.0, this shared code can save hard disk space.

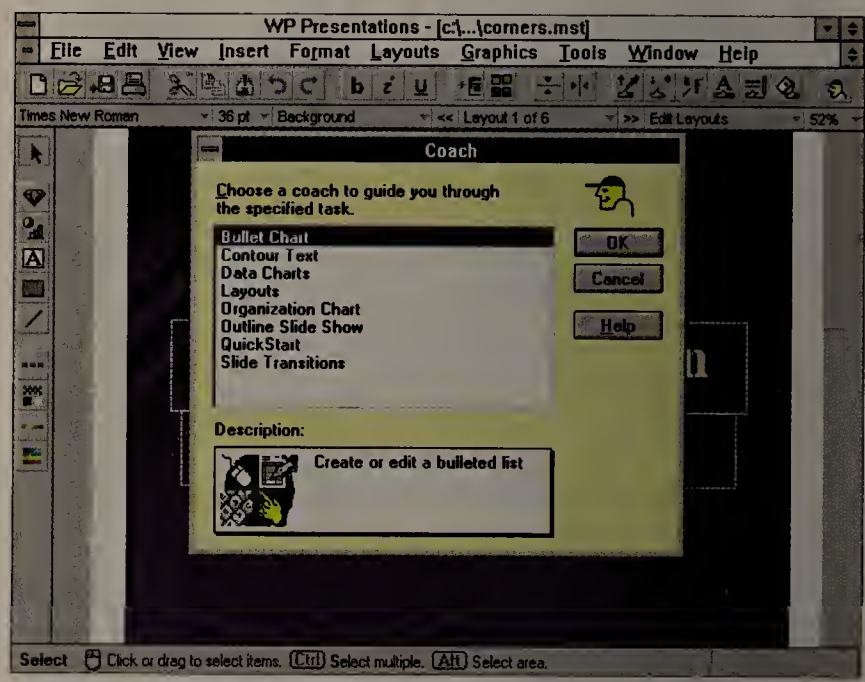
Also impressive are Presentations' new drawing tools, which let you create special effects. For example, you can distort an object's shape or make it appear three-dimensional. In addition, Photoshop-like bit-map filters, such as emboss and blur, let you enhance photographic images and other bit-mapped graphics. And you can open and edit Harvard Graphics and PowerPoint presentations in Presentations 3.0—cross-app compatibility the competition doesn't offer.

Presentations 3.0 is an impressive upgrade. And the product's $395 list price ($129 for a competitive upgrade) makes it a terrific value.

—William Harrel

Presentations 3.0

Improved tools for novices; OLE 2.0 support.
WordPerfect/Novell Applications Group
800/451-5151, 801/225-5000
List price: $395, upgrade $99, competitive upgrade $129
Reader service no. 735



WORDPERFECT PRESENTATIONS 3.0's COACHES make it easier to create a presentation by guiding you step-by-step through the process.

Tower of Babel No More

Computez-vous Windows? If so, you may want to write in Accent Express, a $59, scaled-down version of Accent Software's Accent 1.0 multilingual Windows word processor. Accent Express supports 5 alphabets covering 34 languages and has user interfaces for 8 languages, including English, French, German, and Spanish.

Accent Express includes 30 TrueType fonts and 50 keyboard maps that support the Western, East European, Cyrillic, Greek, and Turkish language groups and alphabets. Multilingual maniacs might write in French with the Roman alphabet, then switch to Cyrillic and write in Russian, but use German menus.

Accent requires about 5MB of disk space and has the basic features you'd expect from a Windows word processor, including an icon bar, ruler, status bar, and drop-down menus, plus functions such as cut-and-paste, undo, and auto-save. But it lacks many common features, notably online help, a spell checker, a thesaurus, and the abilities to drag and drop text and text formats. It imports and exports files only in ASCII and RTF formats.

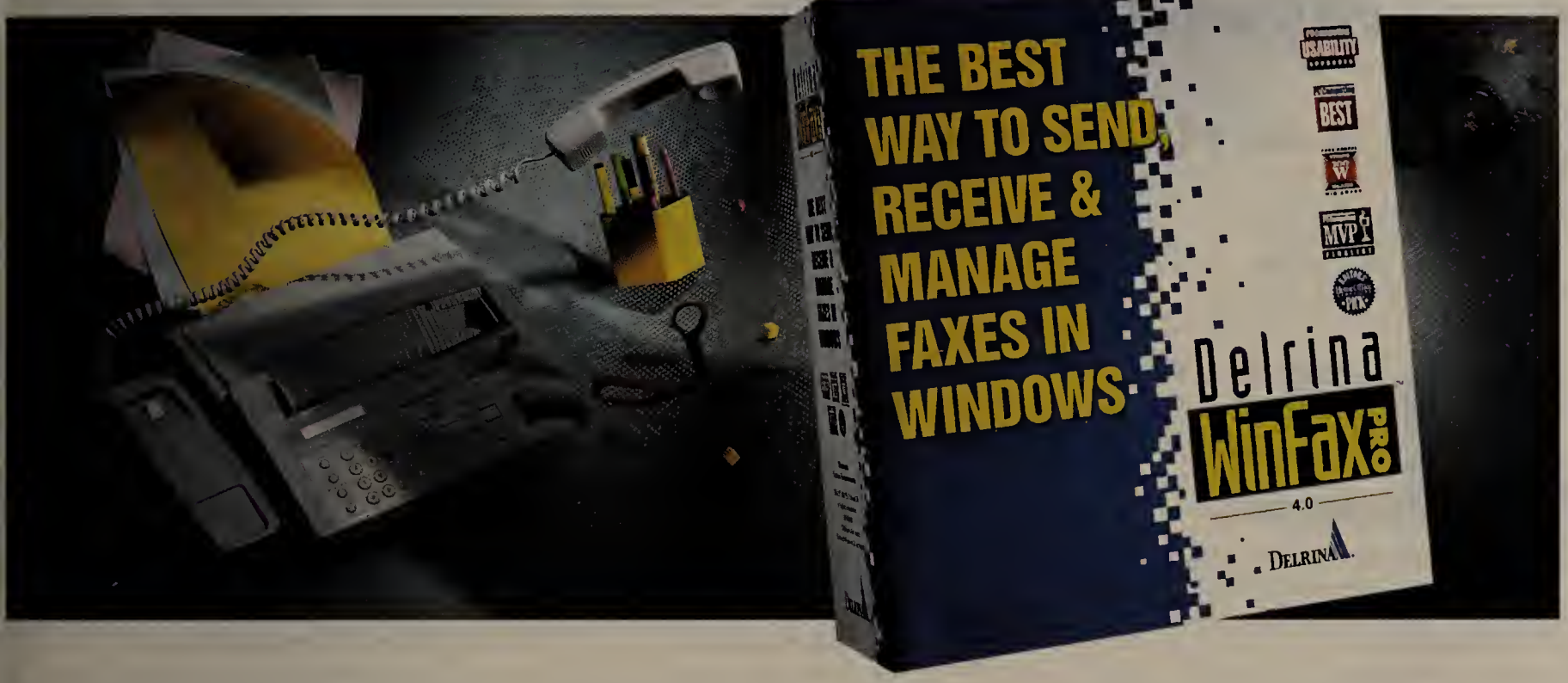
The $349 Accent 1.0 includes 79 TrueType fonts, a multilingual spell checker and thesaurus, support for more file formats, and the Berlitz language interpreter, which translates to and from English, French, Spanish, German, and Italian.

—Shane Rau

Accent Express

Multilingual word processor works in 5 alphabets and 34 languages.
Accent Software Int'l
800/535-5256, 800/535-5257 (fax)
List price: $59
Reader service no. 736

Introducing Delrina WinFax PRO™ 4.0. You'll wonder how you ever faxed without it.



Meet the fastest, easiest, most convenient way ever to handle all your faxing – new Delrina WinFax PRO™ 4.0, the latest version of the best-selling fax software in the world. The only one that combines the advanced faxing features you need with astonishing new ease and usability.

"The best fax package there is."

That's what *PC/Computing* said about version 3.0. And now we've made it even better.

Starting with the revolutionary new streamlined interface that makes it simpler than ever to do anything you'd do with a fax machine, and a lot more. Like sending faxes directly from within any Windows application as easily as you'd print. Or organizing sent and received faxes in convenient folders. Or converting faxes into word processing documents with OCR.

There's added convenience with dozens of ready-to-use cover pages. Fax phonebooks that are drag-and-drop simple. And improved fax annotation tools that even let you add your signature.

Based on extensive usability testing, the new customizable interface includes folders for organizing sent and received faxes.

Don't try this with a fax machine.

Imagine faxing, not just an image of a document, but the actual file itself*, so it's ready to be used in an application. Imagine sending a single document that is automatically faxed to some people and e-mailed to others.

Now imagine you're on the road, and WinFax PRO automatically forwards faxes to you. Or lets you retrieve faxes sent to your regular fax number*. And there's more.

Get new Delrina WinFax PRO 4.0 today and put faxing where it really belongs – on your PC. Call now for information or to upgrade from WinFax PRO or WinFax LITE™. Or see your local dealer to upgrade immediately.

DELRINA
1-800-268-6082

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*Requires Class 1 modem.

Circle 37 on reader service card

So you want a that runs like a and doesn't cost a lot of . Plus you want great support in case the thing goes . ARES offers you caviar computers at prices, with service that's really on the . So if shopping for a PC is driving you to , call ARES.

We're one company

486SX/33 **$1,299**
486DX2/50 **$1,449**
486DX2/66 **$1,499**

ARES Ascension

- ARES desktop case with 250-watt power supply
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- 256k external cache
- teac 3.5 floppy drive
- dtc 2278vl vesa ide controller
- western digital 340mb enhanced ide hard drive
- genoa hornet 32-bit graphics accelerator w/1mb
- vision/lr 14-inch mpr-2 energy star monitor
- keytronics 101-key keyboard
- dos 6.2, windows for workgroups 3.11
- logitech 3-button mouseman with mouseware

Free Stuff!

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- free 96/24 send and receive fax/modem!

Pentium 60 **$2,699**
Pentium 66 **$2,829**
Pentium 90 **$3,069**

ARES Authority Pro

- ARES full-tower case with 250-watt power supply
- intel pentium processor
- pci/vesa/isa motherboard
- 16mb ram, 256k external cache
- teac 3.5 floppy drive
- local bus mode-3 enhanced-ide w/logical block addressing
- western digital 540mb enhanced ide hard drive
- genoa phantom 64-bit pci graphics accelerator w/2mb
- vision/lr 15-inch mpr-2 energy star monitor
- keytronics 101-key keyboard
- dos 6.2, windows for workgroups 3.11
- logitech 3-button mouseman with mouseware

Free Stuff!

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- free 96/24 send and receive fax/modem!

Pentium 60 **$2,149**
Pentium 66 **$2,289**
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PC Computing Five-Star Service — The PC/Computing Direct Top 60 — August 1993
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SB SOUND BLASTER AUDIO

intel inside

Circle 52 on reader service card

Visio Brings Drag-and-Drop Drawing to the Home

Drawing on the success of its popular business-oriented flowcharting program, Visio, Shapeware has introduced a new home-oriented drawing program called Visio Home. As with Visio, you don't need to draw any shapes by hand. Just select any of 900 shapes from over 33 different *stencils* (collections of shapes relating to the same subject), and you can get to work.

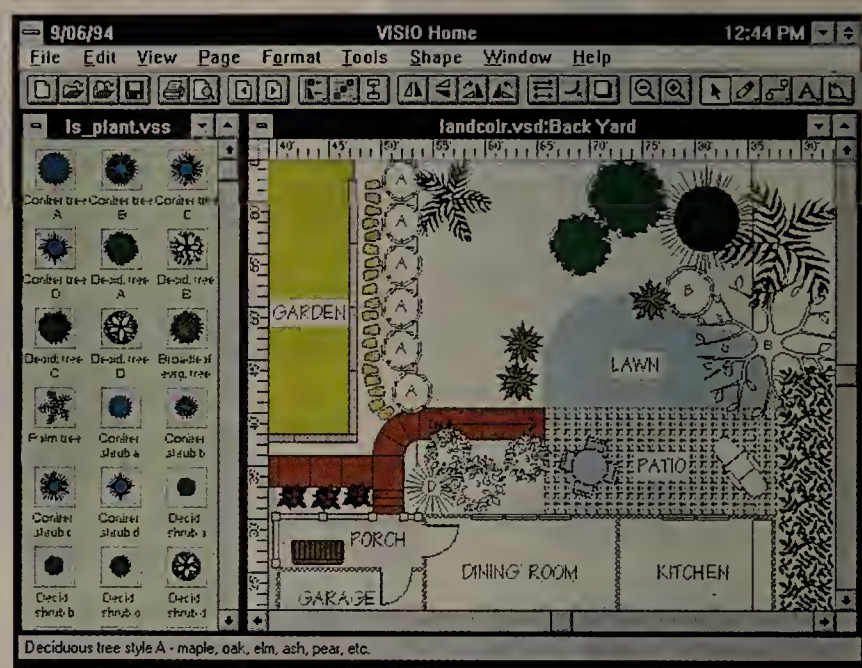
Visio Home lets you easily create home and landscape designs, family trees, calendars, invitations, maps, and greeting cards. It includes many templates for kids, such as flash cards, the alphabet, numbers, a dinosaur coloring book, and football playbooks. If you're not sure what a shape represents, rest the mouse cursor over the object, and a one-line description appears at the bottom of the screen. You can also learn how best to use a shape by clicking the right mouse button.

Visio Home's great selection of predrawn shapes help you create just the effect you want. For example, the home design section lets you choose from among 10 door and 6 table shapes. If that's not enough for you, Visio Home also gives you a few freehand drawing tools that enable you to create your own innovative shapes.

The program takes up a whopping 19MB of disk space when fully installed, so be sure to use the convenient custom install option if hard disk space is limited. This feature lets you install only the most important stencils, templates, and other storage-hungry Visio tools.

I used Visio Home to draw the layout of my apartment. It took me a few minutes to figure out how to move, resize, and rotate objects, but once I did, the program was a breeze to use. The $49 street price ($79 list) is refreshing, too.

—Anita Hamilton



DESIGN TOOL FOR THE HOME: Visio Home gives you all the predrawn shapes you need to redesign your backyard or garden.

Visio Home 3.0

Drag-and-drop draw program for the home.
Shapeware Corp.
800/446-3335, 206/521-4500
List price: $79, street price $49
Reader service no. 737

Alpha Five: Complex Yet Simple Database

Windows databases typically come in two flavors. There's the simple product that keeps adding power features until it alienates its original audience. Then there's the professional-level database, for complex business applications, that claims ease of use. Alpha Five 1.0 is a mostly successful attempt to find the middle ground.

Alpha Five's opening screen features a control panel with tabbed categories. The database offers the basic features you'd find in other Windows databases, like drag-and-drop report design and "genies"—expert systems that help you build a report or query.

Alpha Five provides a way to visually link data files. Rather than use a drag-and-drop tool, you click an object and answer dialog box questions to create relationships between files.

The program has some advantages over its competition. Since database information is often used in business correspondence (such as payment reminders), Alpha Five has a built-in Letters module. Rather than export data to a word processor and wrestle with format conversions and mail merge mysteries, you can create letters within your database program.

But data definition and declaration is where Alpha Five excels. You can create an incredible array of rules or choose from a variety of data transforms and masks. (For example, in the name field you can specify that first names start with a capital followed by lowercase letters.)

Alpha Five has two ways to create database apps. To create forms, its Application Cards let you lay down buttons on forms and describe their actions. For more complex tasks, you use its Xbasic programming language. But Xbasic, while a straightforward language, is too complex for nonprogrammers.

Alpha Five 1.0

Windows database for both simple and complex projects.
Alpha Software
617/894-0003
List price: $149
Reader service no. 738

In the beta version we tested, the help system was barebones, without any graphical aids. The beta manual was thoroughly professional but perhaps too big and intimidating for many users.

There are easier low-end Windows databases, such as Claris's FileMaker Pro, and more powerful tools for building enterprise-wide database apps, such as Paradox for Windows. But as a program that lets you start with simple tasks and evolve to complex application building, Alpha Five for Windows may be your best choice.

—Jeffrey Gordon Angus

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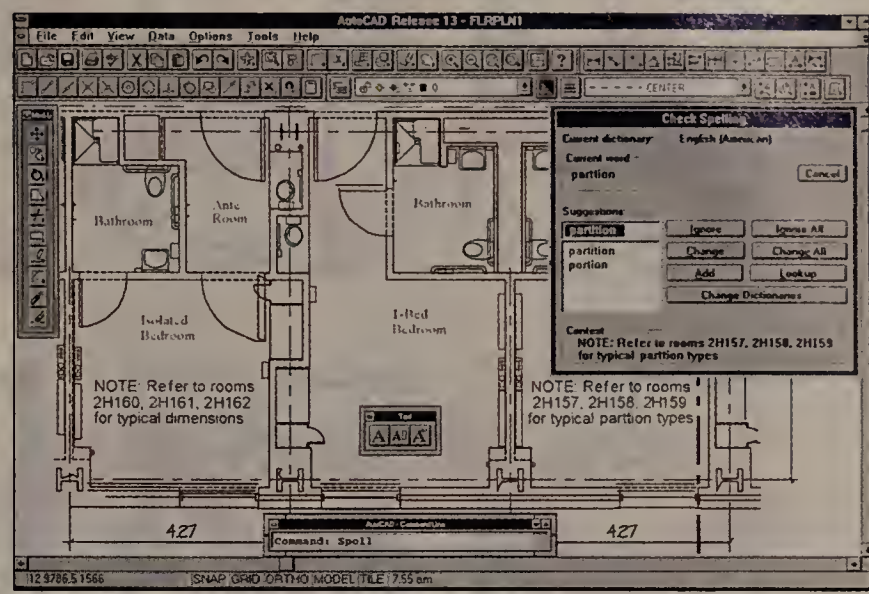
AutoCAD Tries Lucky Release 13 With Easier-to-Use Features

When it comes to computer-aided design (CAD), Autodesk's AutoCAD software enjoys unmatched power, features, and precision. Unfortunately, the program is also difficult to learn. The newest version, release 13, automates many tasks, making the program easier to use.

AutoCAD release 13 includes new dimensioning controls that make it easier to change and track elements, such as walls and columns. It updates hatching after edits, so shaded areas automatically reflect changes in size or property boundaries on an architectural image. Objects such as columns, windows, and walls are invested with intelligence and properties that let them behave consistently and accurately when elements around them change. Release 13 also provides improved text handling and supports TrueType and PostScript Type 1 fonts. It has a spelling checker and supports 3-D drafting and solid modeling—tools that give AutoCAD the power to tackle the most complex design tasks.

Release 13 also features a customizable interface with icon bars and editable command menus. It supports OLE 1.0 and Microsoft's Visual Basic language, making AutoCAD look and feel more like a true Windows program. AutoCAD comes on floppy disks and on a CD-ROM that includes versions for DOS, Windows, and Windows NT. Under Autodesk's multiplatform license agreement, you can use the program on all three platforms. AutoCAD 13 costs $3750 on CD-ROM, or $3995 on floppies. Users of release 12 can upgrade to the new version for $495.

—Michael Desmond



AUTOCAD GETS FRIENDLIER: AutoCAD release 13 features a new spell checker to correct typos, plus other ease-of-use enhancements.

AutoCAD release 13

Cadillac of CAD software is easier to use.
Autodesk
800/964-6432, 415/507-5000
List price: CD-ROM $3750; floppies $3995; upgrade from release 12 $495
Reader service no. 787

HiJaak 3.0 Creates, Captures, and Edits Images

Need an image fast? Inset Systems' venerable HiJaak still captures, converts, and manages images. But it's got a new name—HiJaak Graphics Suite 3.0 for Windows—and has several new utilities that give it even more muscle: HiJaak Draw creates and edits vector drawings, HiJaak TouchUp alters photographic raster images, and HiJaak Smuggler converts and imports graphics into Windows business apps from more than 70 raster and vector file formats. And the preview window lets you view more than 30 special effects (such as blur, emboss, and sharpen) before applying them to images.

HiJaak 3.0 can even look for words encoded in a graphics file—that is, code, not words that are part of a graphic. Graphics are made up of computer code; inside that code are words describing screen elements, such as a color or shape. HiJaak 3.0 searches the code for these descriptors and tags all appropriate images. For instance, type **circle** or **red**, and HiJaak will present thumbnail images of all graphics files with these elements. It's a quick, if inexact, way to find certain types of images. HiJaak Browser is a file viewer that lets you organize images and video clips into groups and assign keywords to them.

The street price for version 3.0 is $99; upgrades from HiJaak Pro 2.0 are $49.99—$59.99.

—John Goddard

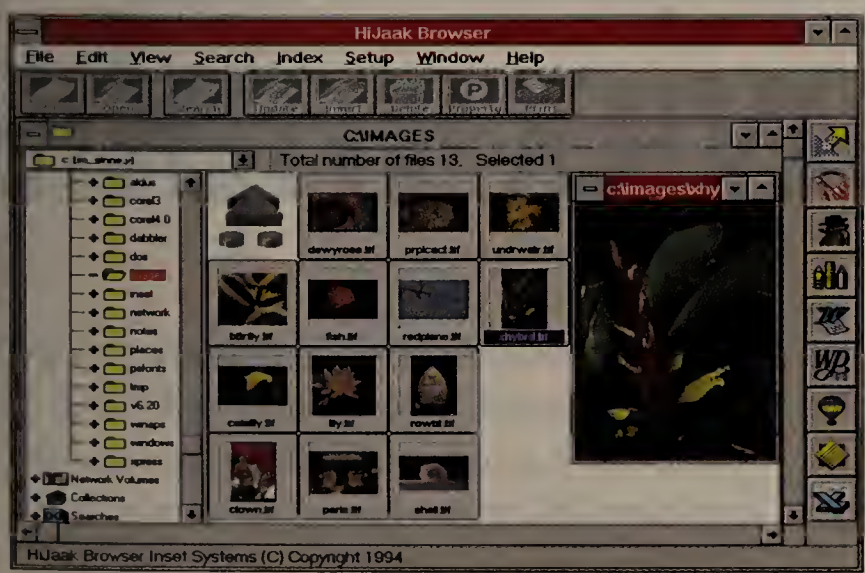


IMAGE ORGANIZER: HiJaak Graphics Suite 3.0's Browser tool makes it easier to catalog a hard disk's worth of image files.

HiJaak Graphics Suite 3.0 for Windows

Graphics utility adds more features.
Inset Systems, Inc.
800/374-6738
Estimated street price: $99
Reader service no. 788

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Armchair Golfing: A Guided Tour of Top U.S. Courses

CD-ROM technology is at its best when used by an expert to convey comprehensive, detailed information about a subject. Such is the case with The American Golf Guide Presented by Arnold Palmer.

I piddled with golf through my late teens and early 20s, and became more infatuated when business and income made golf more accessible, even necessary. If ever I consistently break 90, I may even plan a golfing vacation, or at least a vacation that involves golf.

If this describes you, too, then you're part of the target audience for The American Golf Guide. The CD-ROM includes information on no less than 11,500 courses to help you plan a golf vacation. If you're not going anywhere, you can just browse the video gallery or slide show. The program includes more than 500 beautiful color photographs of the top courses, as well as 15 minutes of video from helicopter flyovers. You also get scorecards with par, slope, course length, and rating information for 91 courses.

To help you plan your trip, the Golf Guide provides information on hotels and meeting facilities, and directions for getting there. It also includes color weather maps for every region of the United States.

The Golf Guide attempts to broaden its appeal by including information on major nongolf attractions, but I wouldn't invite nongolfing companions and expect them to have a good time.

—Joe Abernathy

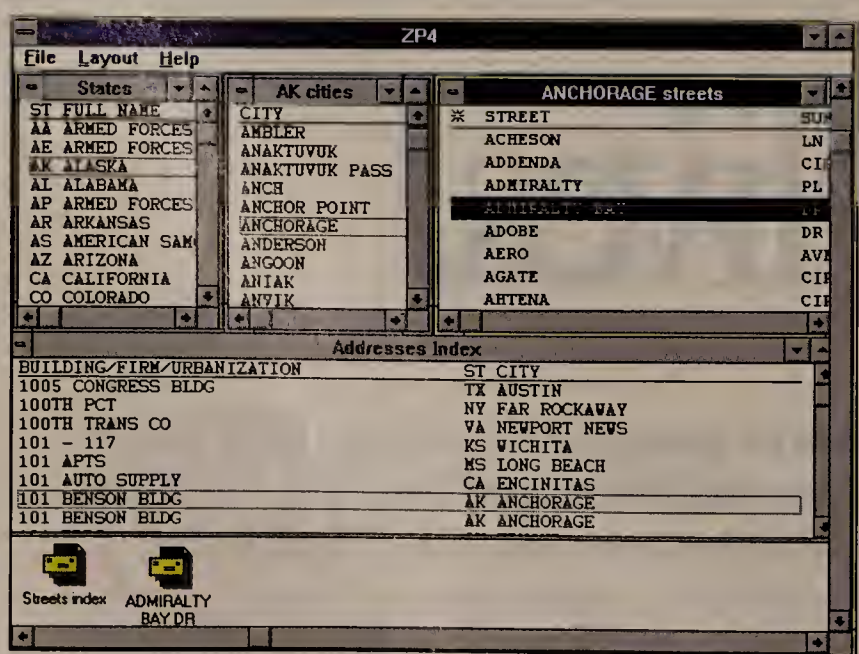
The American Golf Guide Presented by Arnold Palmer

Helps plan golf vacations.
DataTech Software
717/652-4344
800/556-7526
List price: $59.95
Reader service no. 720

GOLF FOR MOUSE POTATOES: The American Golf Guide has more than 500 color photos of the top golf courses in the United States.

ZP4: Addresses, Zip Codes, and More

Marketing, networking, and a good product are the keys to business success. But to reach the largest market, you also need thousands of addresses at your fingertips. Semaphore's ZP4, a national database of U.S. addresses, mail carrier route numbers, and nine-digit zip codes, gives you a way to reach the largest audience.



U.S. POSTAL ADDRESSES ON CD-ROM: ZP4 for Windows is a database of addresses that's useful for creating mailing lists.

This isn't what I'd call an exciting product—ZP4 simply makes zip codes convenient. It contains the official U.S. Postal Service address database, with some 30 million records. The CD-ROM boasts over 1.2 million companies and organizations listed by name. Since ZP4 is an address database but *not* a mailing list, it doesn't include personal names.

The interface is well organized and easy to use. You can search for an address by state, city, street, house, and apartment number. ZP4 then supplies the complete, correct Postal Service–approved address. It also corrects mailing list information, including poorly specified addresses. If you use a DDE-compliant database, you can pass inaccurate addresses to ZP4, which then sends the corrected address back to your program. ZP4 can correct mailing lists stored in Paradox, dBASE, and other file formats. While the $125 list price may seem steep, an unlimited number of users can access the program across a LAN. The convenience is worth the price.

—Arden M. Hoffman

ZP4 for Windows

Database of U.S. street addresses and zip codes.
Semaphore Corp.
408/688-9200
List price: $125
Reader service no. 721

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PC MAGAZINE EDITORS' CHOICE

August 1994
TM4000M/25

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July 1994

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Circle 220 on reader service card

WinComm Pro Simplifies Internet E-Mail

Internet E-mail is like some package delivery companies: You can send your mail almost anywhere, but you may have to deal with arcane regulations and unfriendly service. Delrina's WinComm Pro 1.1 goes a long way toward solving that problem with its new Internet Messenger, a powerful addition to an already solid communications package. (WinComm is available in a stand-alone version and as part of Delrina Communications Suite, which also includes WinFax Pro 4.0.)

Internet Messenger works with the standard Internet account available from dozens of service providers, including the World, Portal, Netcom, and Delrina itself. If you don't have an account, it takes only a few minutes to sign up for one. Just give Messenger your area code, and it will help you find a nearby provider and step you through the enrollment process.

Once you have an account, managing Internet mail with Messenger is as straightforward as using LAN-based E-mail. It separates your mail into an in-box and an out-box, each of which can be sorted in a variety of ways, and it provides a point-and-click address book that eliminates the need to remember complex Internet addresses. You can compose messages using standard Windows editing tools, such as a spelling checker, and automatically append a "signature" (the lines of personal information and pithy sayings that many Internet users end their E-mail with).

Managing incoming mail is simple, too. If you choose, Messenger will automatically strip off the convoluted Internet mail headers that most users don't need. Icons let you reply to messages, forward them, print them out, and delete them once they're no longer needed.

This is not only easier than trying to use an Internet account directly, it's cheaper. Just about every feature is available without dialing in and running up connect charges. You need to be online only long enough for Messenger to transfer outgoing and incoming messages.

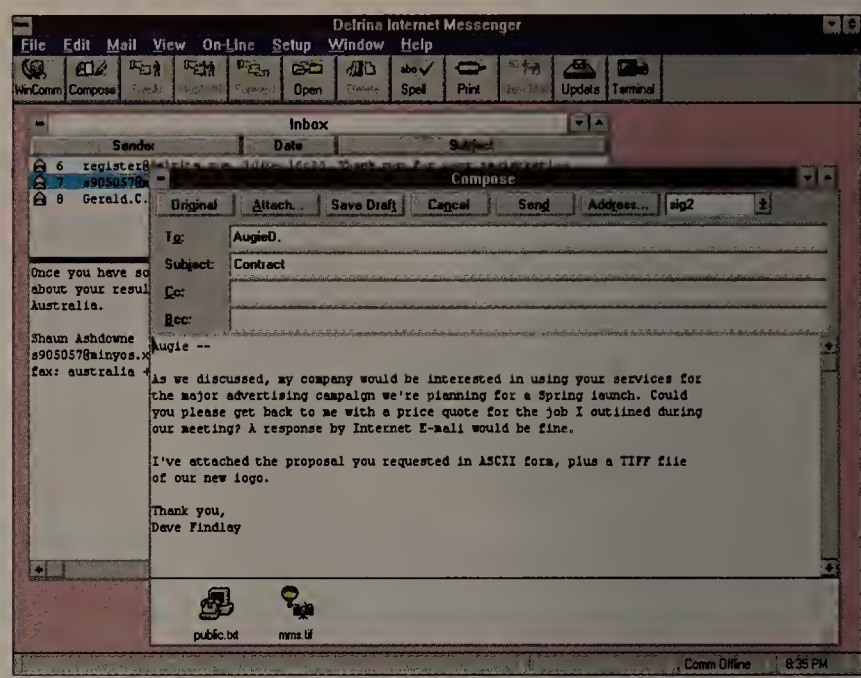
As pleasing as Internet Messenger is, it's integrated only haphazardly with the rest of WinComm. It uses a different scripting language, and rather than letting you access Internet services like FTP and Archie from the standard WinComm terminal, it provides a rudimentary terminal program of its own. In addition, its address book isn't compatible with WinFax Pro's phone books, so Delrina Communications Suite users will need to maintain two databases of electronic contacts.

Internet Messenger is by far the biggest new feature in WinComm Pro 1.1, but some minor refinements are also scattered throughout the program. It now shares Procomm Plus's ability to display GIF images as it downloads them, and it can play WAV sound effects to notify you of events like successful or failed downloads.

—Harry McCracken

WinComm Pro 1.1

New Internet E-mail manager plus other enhancements.
Delrina
800/268-6082
List price: $129, Delrina Communications Suite $179
Reader service no. 744



WINCOMM PRO'S NEW INTERNET MESSENGER lets you compose, send, and receive Internet E-mail via a familiar Windows interface.

Exchange Files Across Platforms

No Hands Software, maker of Common Ground, likes the term "digital paper"; Adobe Systems, developer of Acrobat (see *New Products*, November 1994) prefers "portable documents." But whatever you want to call them, documents that maintain their content and formatting across platforms and operating systems are critical for both workgroups and electronic publishers.

With the sharp-looking, inexpensive Common Ground 2.0, due out for Windows and the Mac by year's end, you can create a document in any application and save it in Common Ground format. Then, any user with a viewer (a 400K run-time utility that you can embed in a document) can view, zoom, search, and print it. An OLE 2.0 server, Common Ground supports both PostScript and TrueType fonts and has enhanced its support of Lotus Notes and the VIM and MAPI mail protocols.

Common Ground 2.0

Windows and Macintosh file exchange tool.
No Hands Software
800/598-3821
List price: $99, miniviewer free for noncommercial applications
Reader service no. 745

The $99 package sports zippy text search and retrieval, automatic table of contents and hyperlink generation, dynamic thumbnails for navigation, sticky notes, bookmarks, and other handy bells and whistles. A free 150K miniviewer, which omits the text-search capability, will be available for Windows, the Mac, and—in early 1995—UNIX. The package's low cost and guarantee of pixel-for-pixel document fidelity make it a serious challenger to Adobe's PostScript-based Acrobat.

—Steve Fox

Voice Mail, Speakerphone, Data, Fax, and Sound on a Card

If you need an inexpensive way to boost your PC's sound and communications capabilities, check out Boca's SoundExpression 14.4VFp card. Selling for about $179 on the street, the product bundles a 14.4-kbps fax-modem, voice-mail capabilities, and 16-bit sound with FM synthesis and Sound Blaster compatibility, all on one 16-bit add-in card. A call detection feature lets the board distinguish between voice, fax, and data calls automatically. In addition, the product includes a speakerphone feature for hands-free phone conversations. The SoundExpression 14.4VFp would be a slick addition to a home office or small business.

The included communications and sound software is intuitive. In the communications program, FaxWorks Call Center, you can access a basic phone book, a telephone keypad with speed dialing, and an integrated voice/fax mailbox from one screen. To work with voice messages, just click buttons on the on-screen image of an answering machine. Call Center accommodates up to 1000 password-protected mailboxes, so you can keep family and various business messages separate, and it lets you retrieve messages remotely.

You can send and receive faxes in the background while you work in other applications, or send broadcast faxes after hours to save money. The program also lets you retrieve new faxes remotely. For pager users, the program will send notification of faxes and calls.

The program even supports a basic fax-on-demand system; using it, callers can listen to a menu of documents and then get selections faxed to them. For instance, a catering business could set up a selection of sample lunch menus for prospective customers.

—Laurianne McLaughlin

BOCA'S SOUNDEXPRESSION 14.4VFP BOARD bundles FaxWorks communications software (above) with an innovative fax-modem.

SoundExpression 14.4VFp

This card provides 14.4-kbps fax-modem, voice mail, speakerphone, and 16-bit sound capabilities.
Boca Research Inc.
407/997-6227
Street price: $179
Reader service no. 746

An Easier Way to Network Your CD-ROM Drives

Sharing a CD-ROM database across an office can be a pain. Buying employees their own copies of the database is too expensive. Even if you did that, a user who didn't have a CD-ROM drive would still have to find a free workstation that had one. If several people needed the disc, they'd have to wait in line. This could get ugly. CD-View, Ornetix Network Products' CD-ROM server software, addresses this problem. As long as you have a multiuser license for the CD-ROM application, CD-View lets everyone access the same disc from a NetWare network.

CD-View 2.01a lists for $595 for a ten-user license and lets you designate the PC with the CD-ROM drive as a server. The CD-ROM drive is mapped as a network drive, so to users it appears as just another NetWare drive. CD-View also lets you share the hard drive located on the CD-ROM server.

The product includes a caching feature that stores CD-ROM data in RAM. This improves performance and lets people use the same CD-ROM at the same time. In an office where users need simultaneous access to the same disc, the server will need additional RAM for caching, beyond what the system needs for its own use. For 25 simultaneous users, you may want to add up to 12MB of extra RAM.

CD-View is a network administrator's dream. Your administrator won't have to reconfigure or add any software to the regular NetWare server, and he or she won't have to shut the network down to install CD-View. The administrator installs it on the CD-ROM server, along with Microsoft's CD-ROM extensions. The workstations use the NetWare shell that's already installed, so there's no software to add there either. The administrator uses standard NetWare utilities such as SYSCON, LOGIN, and MAP to manage the system.

The product has a couple of drawbacks: Currently there is no way to prevent users from removing a disc while someone is using it. In addition, you can't tell which CD-ROM is in the drive without walking over and looking at the disc.

CD-View 2.01a can support up to 100 DOS or Windows users simultaneously and can automatically detect as many as 24 CD-ROM drives.

—Carrie Thomas

CD-View 2.01a

An easy, economical way to share CD-ROM drives over a NetWare network.
Ornetix Network Products
800/965-6650
List price: 10-user license $595, 100-user license $895
Reader service no. 747

ViewSonic has become synonymous with providing superior high performance color monitors to a demanding industry. As a recognized price/performance leader, we are committed to designing outstanding monitors that continue to win awards. In fact, here are some comments from a few editors:

"Some folks crave performance. Some look for price. And then there are those who want it all. If you belong to the third crowd, the ViewSonic 17 is the monitor for you." **– PC World; April 1994**

"Best color quality, best sharpness and best versatility – what more could we ask of the ViewSonic 17? Frankly, we were surprised that one monitor could do it all."

– PC Computing; January 1994

"ViewSonic has one of the sharpest, most detailed and well-focused displays around."

– Windows; September 1994

Our ***new*** ViewSonic 17 monitor is loaded with features including OnView™ controls (on-screen menu to adjust screen images to your liking), ViewMatch™ (matches screen colors to printer output), ARAG® coating (virtually eliminates screen glare and reflection), and refresh rates up to 160Hz. No wonder this 17" monitor (15.7" diagonal viewable area) keeps on winning awards, generation ... after ... generation!

See. A

The Di

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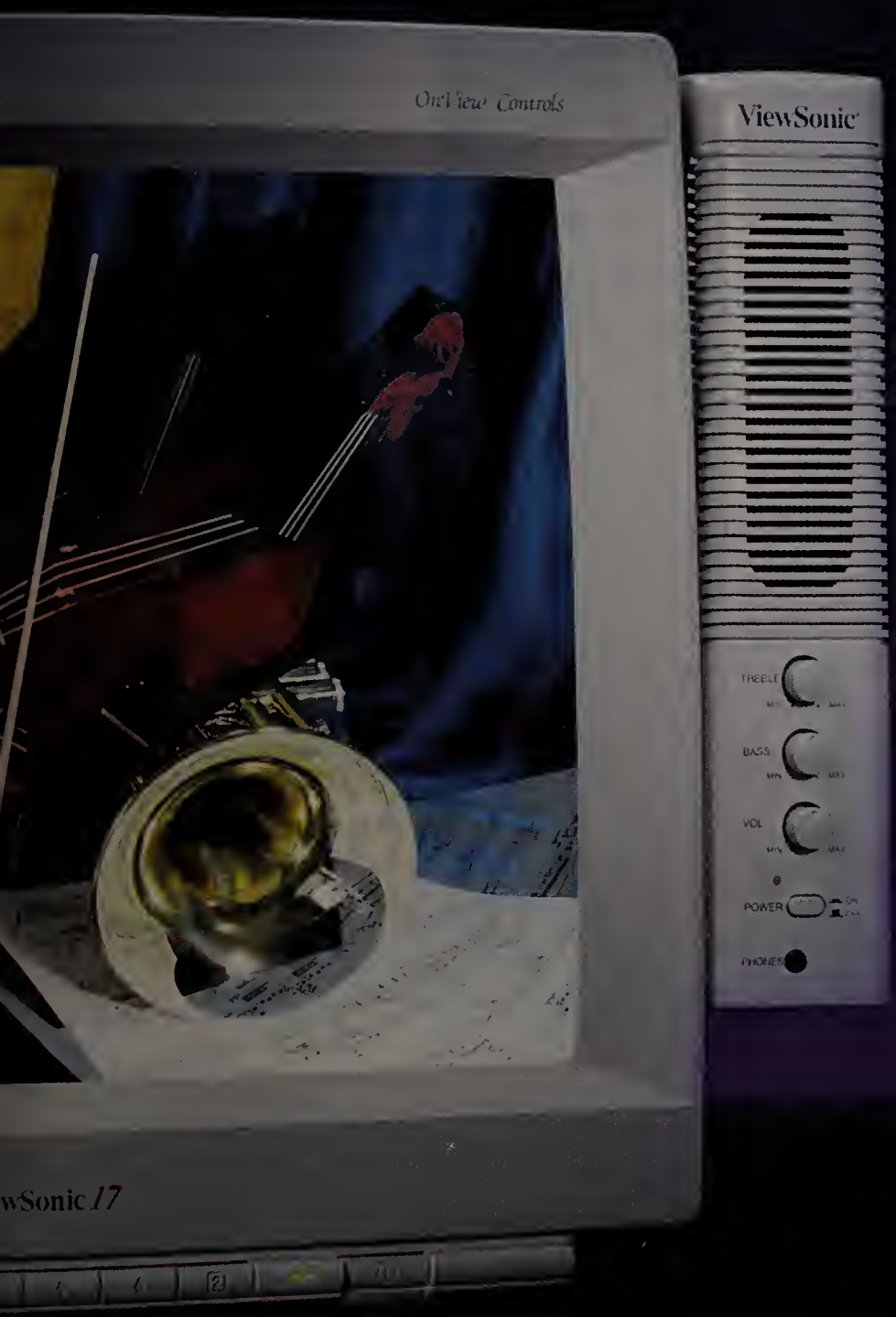

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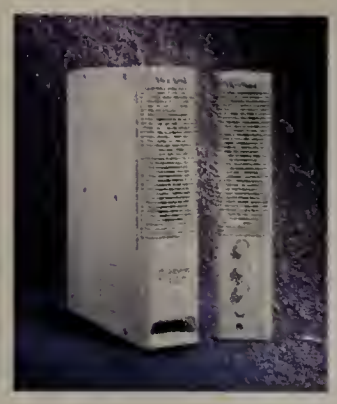

With an eye and ear towards the future, ViewSonic is expanding into the world of multimedia – with our new ***PerfectSound***™ Model VS127 speakers. These *amplified, magnetically shielded* speakers are designed to be attached to the monitor or stand alone. In fact, when attached to our monitor they blend in so well they appear to be built-in. And they utilize state-of-the-art *wave guide technology* combined with a bass enhancing *super woofer*. These speakers pump out high fidelity sound with such power and clarity that you'll find it hard to believe you're listening to a compact 14 watt system. ***PerfectSound***™ speakers offer advanced audio technology combined with an *ergonomic, space saving design* – each speaker is only 2.4" wide! Controls include bass, treble, balance and master volume.

Sounds so vibrant and realistic, you'll swear you're sitting in front of an orchestra – not your computer!

The ViewSonic 17 is MPR-II low radiation and EPA Energy Star™ compliant.

The first of the multimedia product line from ViewSonic!

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Request Doc. 320 (VS127), 152 (17)
Applelink: VIEWSONIC Compuserve: 73374, 514

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Listen 2.0 for Windows

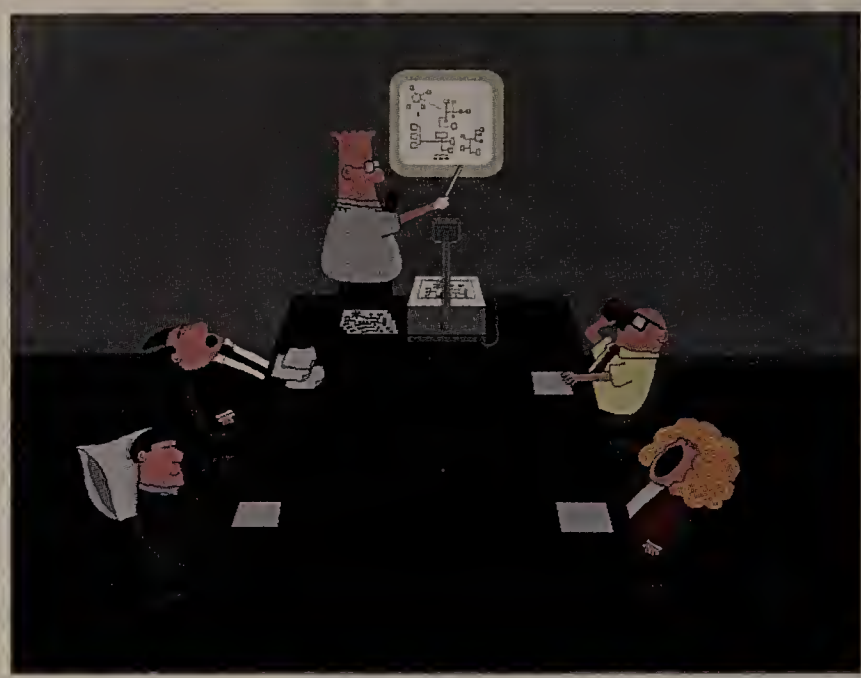
We all talk to—or yell at—our PCs from time to time. Now Verbex Voice Systems' Listen 2.0 for Windows lets you engage in a meaningful dialogue with your computer. This software package enables you to use speech commands to control your computer and runs on a 25-MHz 486 or faster PC with a sound card. Listen 2.0 for Windows is *speaker-independent* for North American dialects, meaning you don't have to train the software to understand your voice commands. It comes with speech "interfaces" for more than 40 popular Windows programs, including Microsoft's PowerPoint 4.0 and Works 3.0, and Symantec's Act 1.1. Listen 2.0 gives you hands-free control of an application, allowing you to open files, highlight text, and perform other basic tasks. You can also train it to improve its accuracy. The program lists for $139 with microphone and $99 for software only. Verbex Voice Systems, 800/275-8729.

Reader service no. 708

Dilbert Screen Saver Collection

Are you a caged corporate rat, toiling away in a cramped cubicle for Enormous Bureaucracy, Inc.? Then Delrina's Dilbert Screen Saver Collection is for you. Based on Scott Adams's syndicated *Dilbert* cartoon strip, this $39.95 package features 16 screen saver modules that bring Adams's sardonic view of the corporate world to your desktop. You get all your favorite *Dilbert* characters, including Dilbert himself, the naive, wage-slaving engineer, and Dogbert, our hero's cynical mutt. The Dilbert Collection runs on top of Delrina's Intermission 5.0 screen saver engine, which can also run modules from other popular screen savers, including Delrina's Opus 'n' Bill, The Far Side, and The Flintstones. Delrina, 800/315-5848, 408/363-2345.

Reader service no. 709



CORPORATE BORED MEETING: Delrina's Dilbert Screen Saver Collection captures the offbeat humor of Scott Adams's popular comic strip.

More PC Tools for DOS and Windows

Aimed at people who use both DOS and Windows programs, Central Point's latest utility package helps with everything from unexpected system crashes to arcane Windows configuration files. The enhanced CrashGuard Pro utility tracks system resources, such as available RAM and hard drive space, and warns you if levels are too low. The package includes diagnostic tools for deciphering hardware conflicts, and it tests performance of the modem, CD-ROM, and CPU. The DriveCheck utility scans the hard drive and checks for fragmentation and other problems. The estimated street price for More PC Tools is $49. Symantec, Central Point Division, 800/964-6896, 503/690-8088.

Reader service no. 710

Harvard ChartXL

This sophisticated Windows charting tool lets you display valuable business data graphically, making it easier to analyze and share. Harvard ChartXL features 183 two- and three-dimensional chart types, including charts designed specifically for business, financial, statistical, and technical data. Business users can select from 78 models, including Gantt charts, bubble plots, and traditional pie, bar, area, and line charts. Harvard ChartXL can import data from such popular programs as Lotus 1-2-3 and has been granted "Microsoft Office Compatible" status by Microsoft, meaning that Harvard ChartXL integrates with existing Office applications. Harvard ChartXL lists for $149. Software Publishing Corp., 800/234-2500.

Reader service no. 711

OfficeF/X

Ungraceful as the word may be, *telephony* is the big kahuna on the latest wave of communication products. IBM's Mwave DSP technology provides the foundation for Spectrum Signal Processing's OfficeF/X, a communications add-in card that combines telephony features with 16-bit audio and 14.4-kbps fax and data transmission. The heart of OfficeF/X is Switchboard, a Windows program that operates as a voice-mail system and has a single in-box for faxes, E-mail, and voice mail. Switchboard collects incoming and outgoing messages and provides multiple mailboxes. OfficeF/X can detect incoming voice and fax messages and process them accordingly. You can screen incoming calls, place calls on hold, and dial in from a remote site to retrieve voice, fax, and E-mail messages. OfficeF/X lists for $349. Spectrum Signal Processing, 800/667-0018.

Reader service no. 712

Phaser 140 and 540 color printers

Tektronix's two new color printers target vastly different audiences. The Phaser 140 is a plain-paper, 360-dots-per-inch printer designed for small offices. Featuring Canon's A-161 Bubble Jet print engine, the $1695 Phaser 140 includes 17 resident fonts and prints color pages at an average speed of 1 page per minute. For sophisticated color printing, the Phaser 540 is a 4-ppm color laser printer (14 ppm monochrome) designed for graphics professionals and business users needing fast, high-quality color output. It prints at 300 and 600 dpi and includes a 250-sheet paper tray. The Phaser 540 is priced at $8995. Tektronix, 800/835-6100, 503/682-7377.

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For more information about any product, contact the manufacturer or circle the number on the reader service card.

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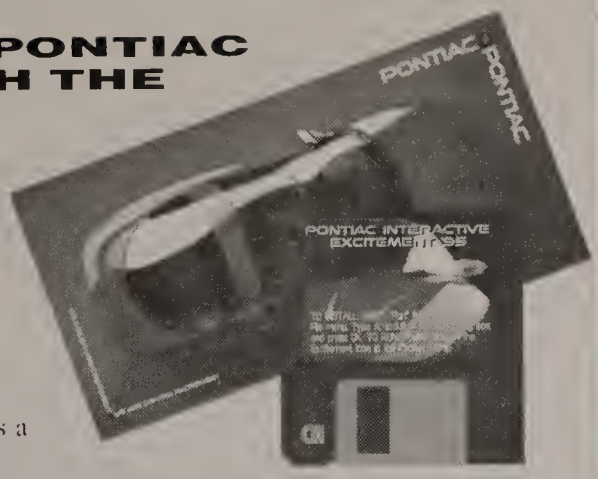

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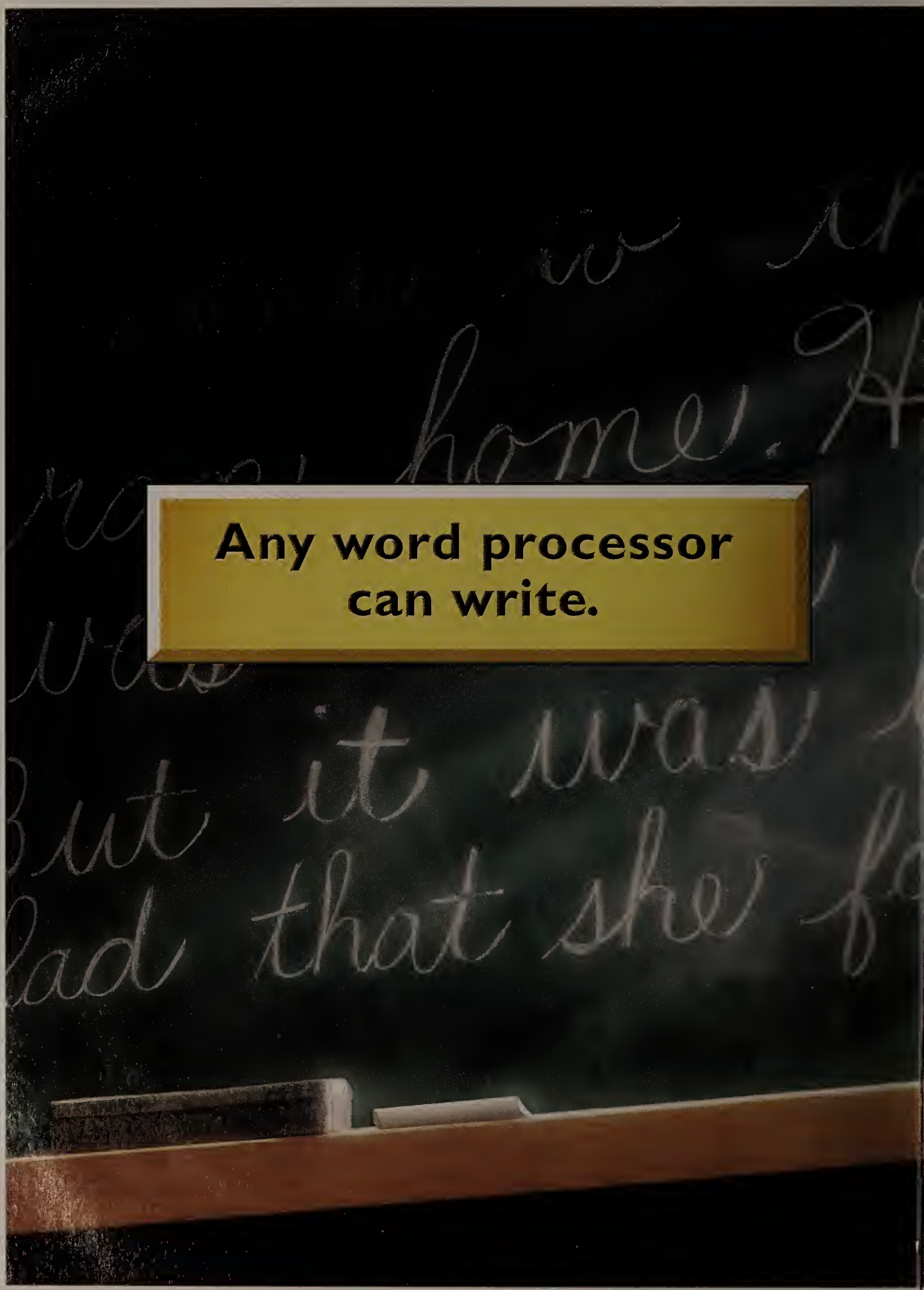

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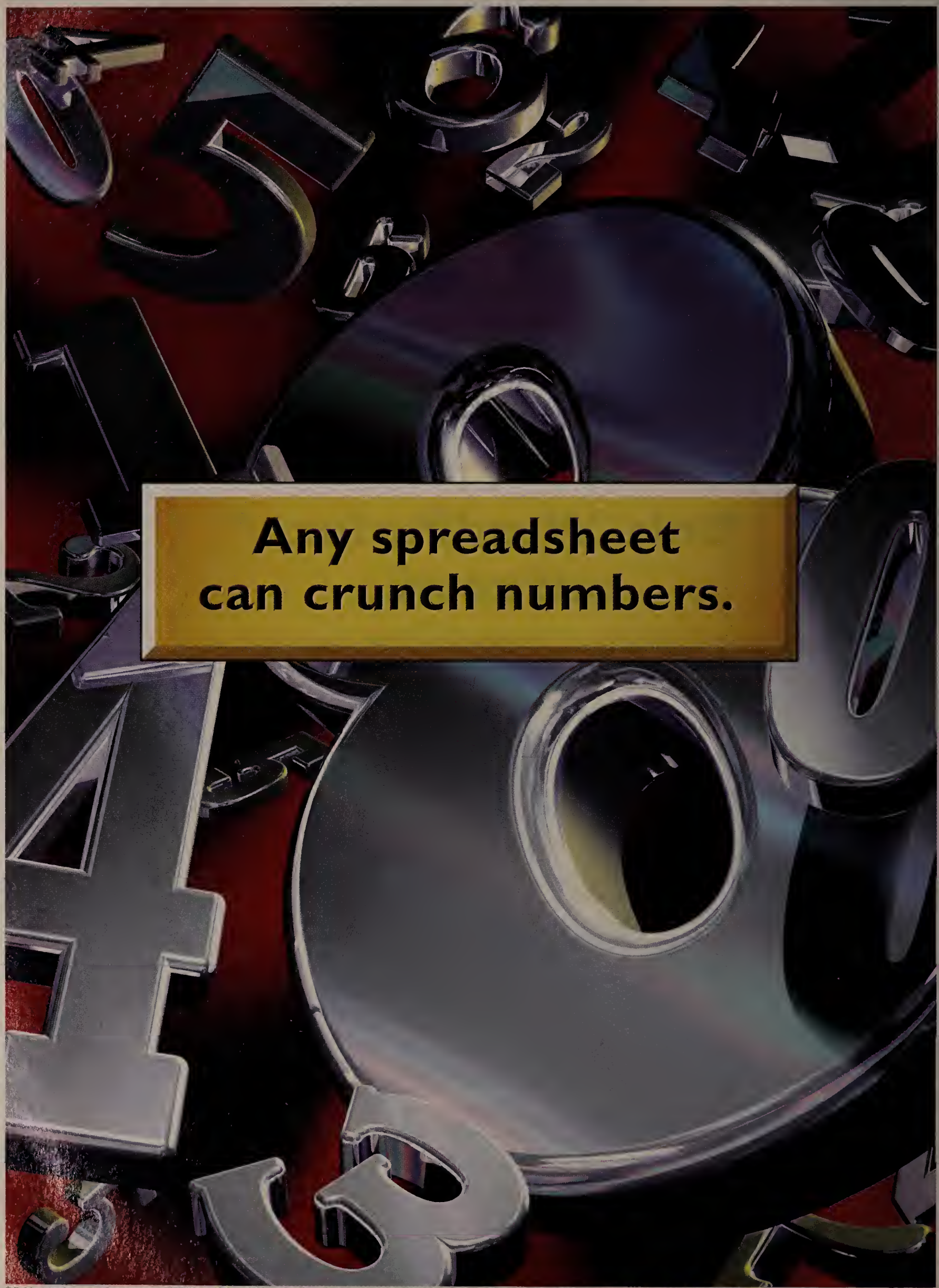

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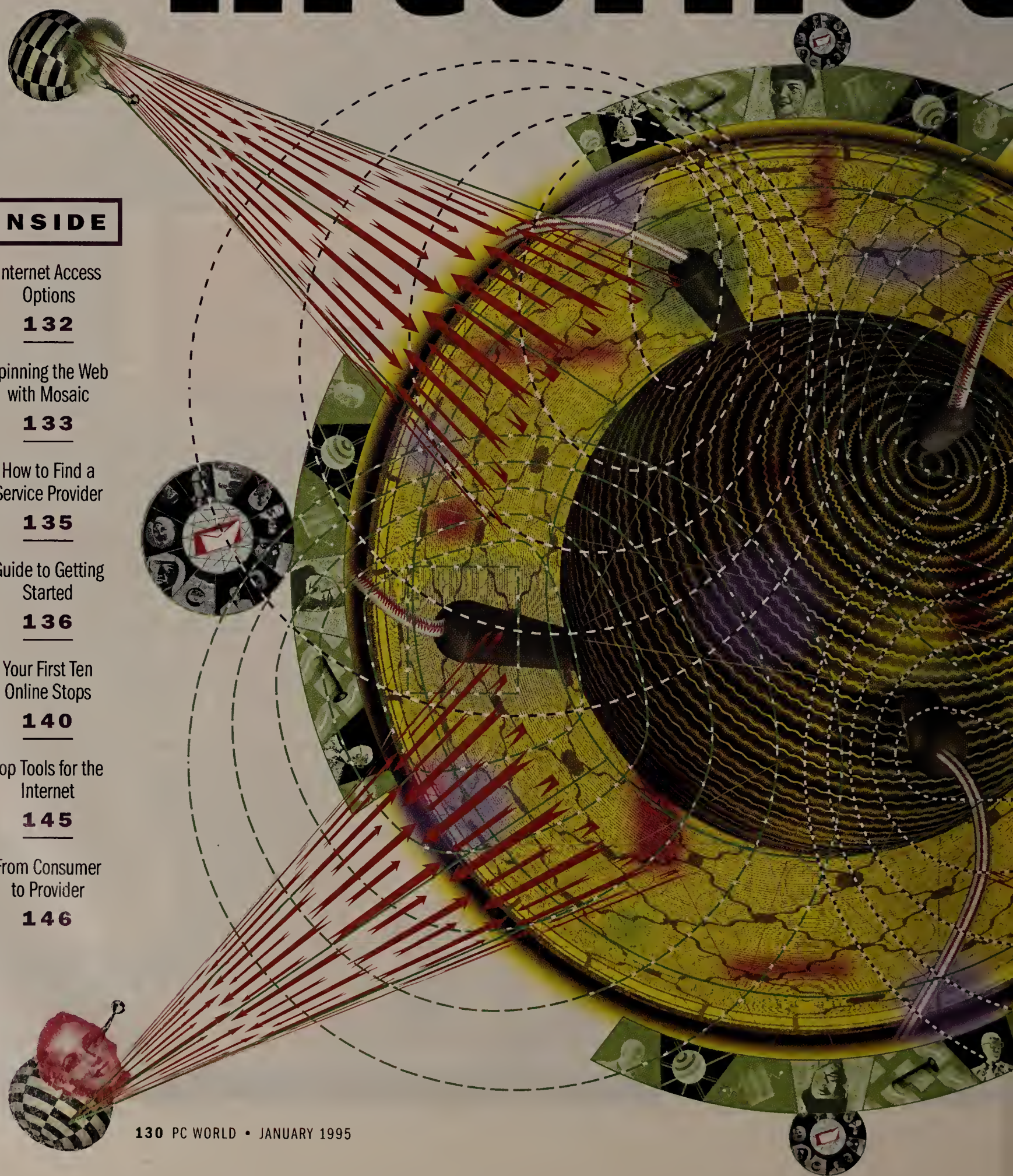
The internet



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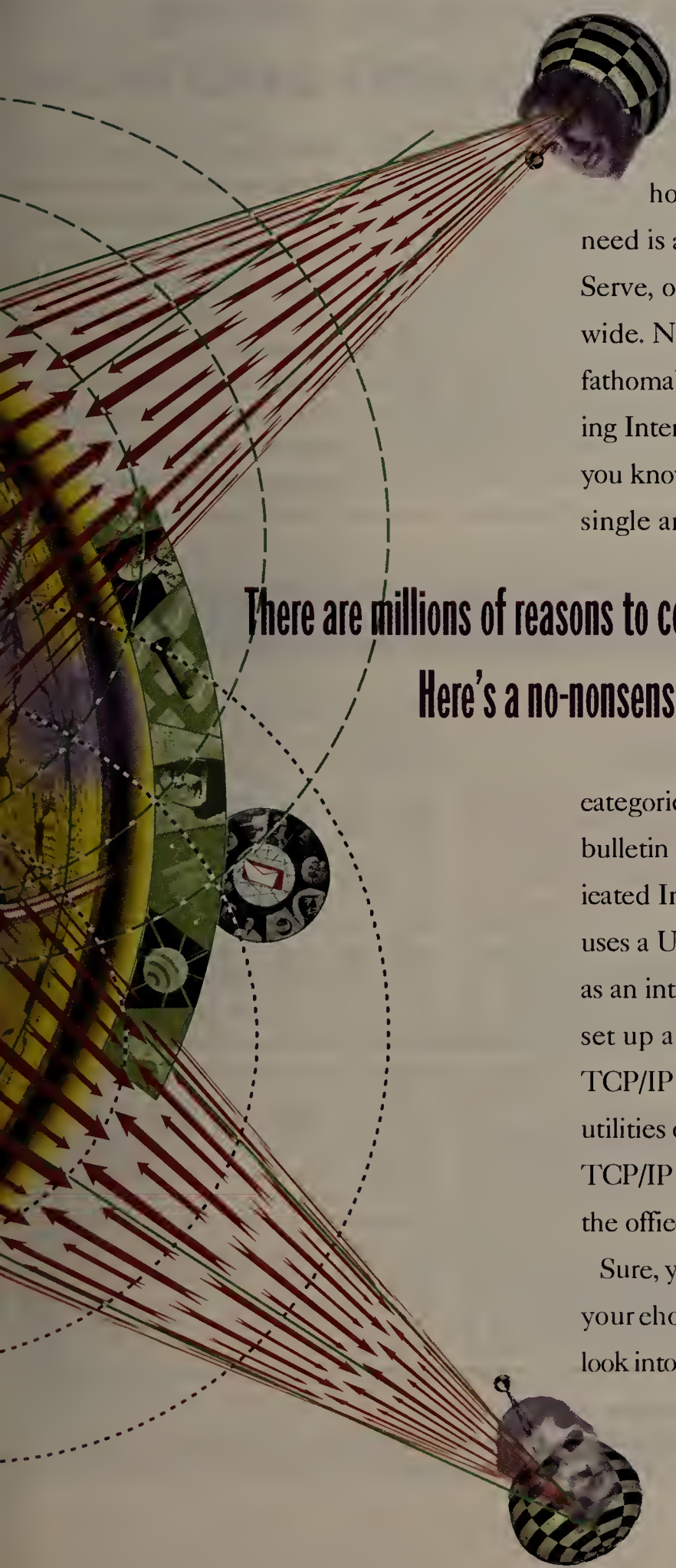
JOHN HERSEY

[How to Get There From Here]



THE INTERNET HAS GONE MAINSTREAM. Once you needed an account at a university or government agency and a working knowledge of UNIX to get hooked into this vast international network. Now all you need is a modem and an account with America Online, CompuServe, or any of the dozens of Internet access providers nationwide. New Windows applications make navigating the Internet fathomable (if not always easy), and Microsoft and IBM are building Internet software into new versions of Windows and OS/2. So you know you *can* get connected; the question is how. There's no single answer for everyone, but the options fall into four broad

There are millions of reasons to connect to the Internet and dozens of ways to do it. Here's a no-nonsense guide to the simplest, cheapest, and fastest routes.

categories: **1** Connect through an online service's or electronic bulletin board service's Internet gateway. **2** Contract with a dedicated Internet access provider and set up a shell account, which uses a UNIX command line or the provider's proprietary software as an interface. **3** Contract with an Internet access provider and set up a SLIP or PPP account; install a network protocol called TCP/IP and a collection of search, retrieval, and communications utilities on your system. **4** Connect your entire company. Install TCP/IP and Internet utilities on systems in your office, then hook the office LAN to an access provider via high-speed phone lines.

Sure, you've got a lot of options, but there's an easy way to narrow your choices. First decide what you want to do on the Net. Then look into the cost and availability of software and access providers.

BY JOE ABERNATHY

To TCP/IP or Not to TCP/IP?

To understand the differences between these four options, you have to know something about TCP/IP. The Internet is a network of all kinds of computers that use myriad operating systems. Packets of data travel from system to system along the Internet until they reach their destination. Internet's designers needed a lingua franca the systems could understand, so the packets could get where they were supposed to go, even if some links in the Net were down. The result is a communications protocol called Transmission Control Protocol/Internet Protocol.

Your four access options fall into two groups: Options 3 and 4 require you to install TCP/IP on your system; options 1 and 2 don't. In general, the closer you are to TCP/IP, the more unfettered your access to the Internet. If you think of the Internet as a network of roads, options 1 and 2 are like public transportation—they're simple to use, but you can go only where your online service or access provider is willing to take you. Because of TCP/IP, options 3 and 4 are more like having a car—once you've learned how to drive, you can go wherever you like.

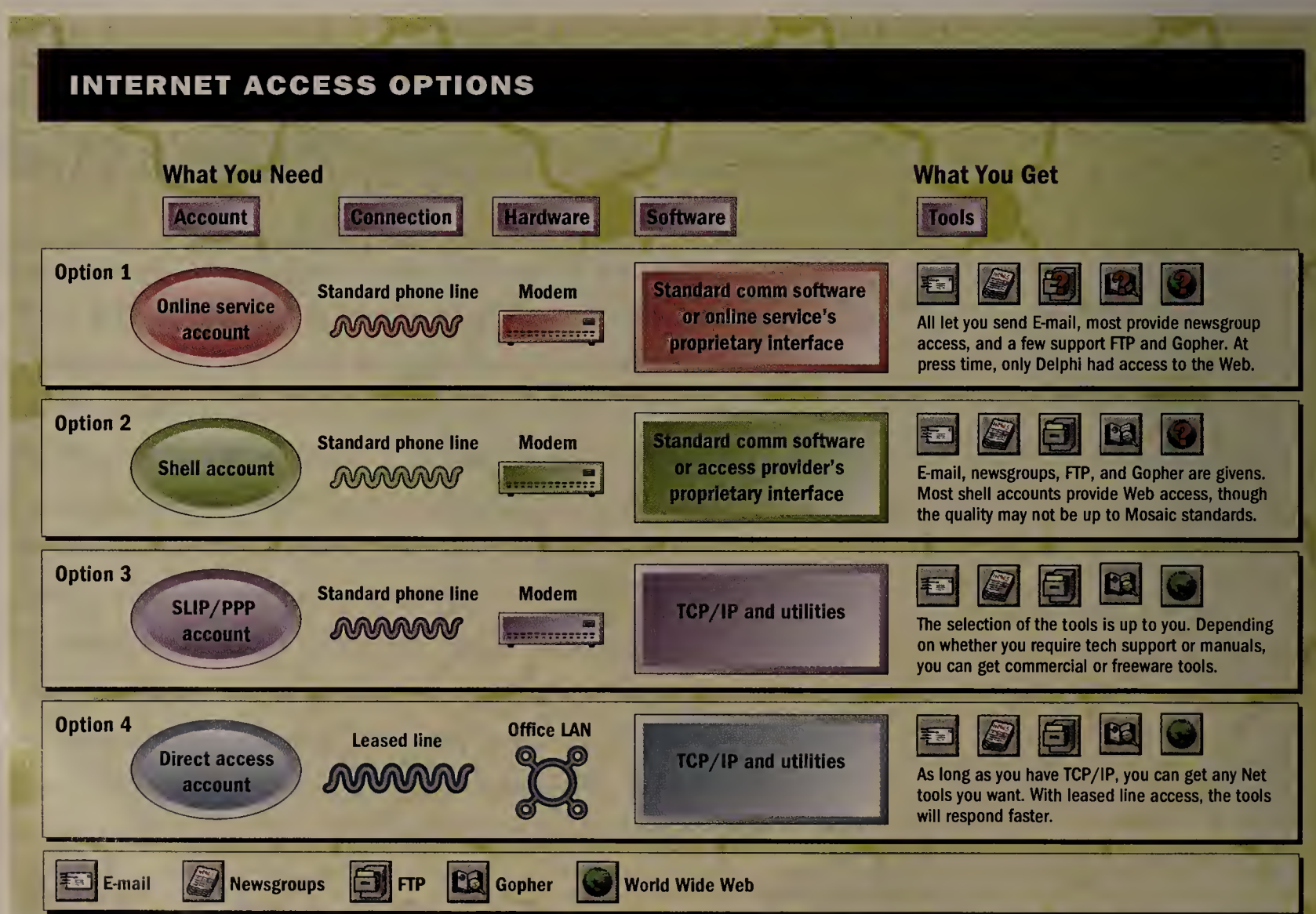
To explore the pros and cons of these options, we set up accounts with the major online services and several Internet access providers. In addition to examining each option ourselves, we also asked a group of users who'd never been on the Internet to test-drive each one. Not surprisingly, we discovered that novices are likely to find the Net far messier and less reliable than user-friendly online services such as America Online and CompuServe. They're also likely to find it dead slow: Connecting to many sections of the Internet at anything less than 14.4 kbps can be torturous.

Some newsgroups are used for serious scientific debate; others contain discussions on everything from Australian football to the music of Frank Zappa.

What Is to Be Done?

The most common Internet activity is interacting with other users, and the most common way to do this is through E-mail. By means of the Internet you can correspond with any of an estimated 30 million users, including subscribers to every significant commercial online service. You can also keep in touch with others through any of the thousands of special interest group discussions known as mailing lists. Messages sent to a mailing list are rebroadcast by a list administrator or automated software agent to all the subscribers on the list. You have to be careful about which lists you subscribe to, because messages can pour in by the hundreds each week.

Once a mailing list grows big enough, it's often transformed into a newsgroup—the Internet equivalent of a bulletin board. Usenet is a subset of the Internet that circulates and stores more than 9000 of these groups, which vary widely in quality and content. Some newsgroups are repackaged news wires (including many business wires), some are used for serious scientific debate, and some contain discussions on everything from Australian football to the music of Frank Zappa. You don't receive



Archie: A utility for finding downloadable files; often found in the Internet malt shop with Veronica and Jughead. **FAQ:** Frequently Asked Questions; responses to routine questions everyone else is tired of answering.

newsgroups as incoming E-mail (as you do with mailing lists); instead, you use a tool called a newsreader to subscribe to a newsgroup and then read and post messages.

The next-biggest activity on the Internet is finding and downloading files. You can get these files—which include software, text documents, images, video clips, and sound—three different ways.

The first and most basic type of Internet file access is via file transfer protocol. FTP is just a way of saying, "Copy this file from system X to system Y," and most systems connected to the Net support it. Of course, you first have to find out which system has the files you want. For that you need a file-search utility called Archie. (Other search utilities have names like Jughead and Veronica—the Net has a puckish sense of humor.)

The second way to get at files is with a utility called Gopher. You use Gopher to log on to Gopher servers and browse files stored there by subject; the aforementioned Veronica lets you search Gopher servers around the world. Gopher is best to use if you're searching for information on a broad theme, such as privacy or semiconductors. FTP is better if you're looking for a specific file or program. Fortunately, Gopher lets you use FTP as well.

The third—and hippest—way to find files is to cruise a subsection of the Internet known as the World Wide Web. Documents on the Web, which can include images and sound, are connected by hyperlinks, so you can hop from one to another by clicking keywords. The killer application of the moment for browsing the Web is a multimedia-capable front end called Mosaic (see "Spinning the Web with Mosaic").

While E-mail, newsgroups, FTP, Gopher, and the Web are the core activities, you'll also hear of others. With Wide Area Information Servers, you can search document databases, including some that contain useful government research; however, WAIS hasn't been implemented widely enough yet to be practical. Telnet allows you to log on to remote computers and run programs from them; you can, for example, use it to access servers that let you play real-time chess and backgammon with other users. IRC, the Internet Relay Chat service, is the online equivalent of CB radio. You'll also see references to utilities such as Ping, Finger, and Whois; Ping determines if an Internet connection is in operation, Finger checks a user's personal identification, and Whois finds a user's E-mail address.

SPINNING THE WEB WITH MOSAIC

The World Wide Web is the fastest-growing part of the Internet, and with good reason. It's what the rest of the Internet *should* be like. The Web is a vast network of documents that combine text, images, sound, and video. It also gives you access to nearly every Internet service, including FTP, news, and Gopherspace. And the Web connects these documents and services with hyperlinks, so you can navigate the Internet by pointing and clicking your mouse.

What really makes all this work is the software you use to view it, and the hottest Web browser right now is Mosaic. Developed with a government grant by the National Center for Supercomputing Applications, Mosaic is free by anonymous FTP from ftp.ncsa.uluc.edu. Documents on the Web are composed in HyperText Markup Language. Mosaic translates HTML files into attractive, readable on-screen documents, making the Web seem more like a traditional, easy-to-navigate online service than other, less friendly parts of the Internet.

Mosaic isn't the only Web browser around—Cello, WinWeb, Netscape (from the designers of Mosaic), and others are available for Windows, and Lynx is a nongraphical Web interface—but it is the hottest. And it's now being developed by Spry, Quarterdeck, and many other commercial software vendors.

That's not to say Mosaic is perfect. It requires a native TCP/IP connection, meaning users with shell accounts can't use it. If you can use it, prepare to spend hours configuring it, and don't expect it to be bug-free. Finally, all that multimedia soaks up massive bandwidth—even at 14,400 bps, you'll likely get bored waiting for Mosaic to update those hyperlinked pages.

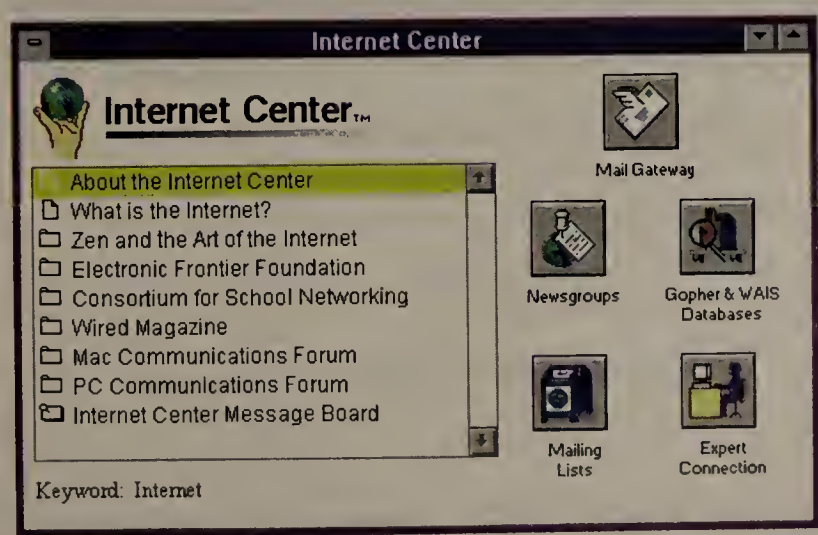
For most users, the wait will be worth it.

Option 1: Online Service Gateway

If all you want is access to E-mail, newsgroups, and some rudimentary file transfer tools, log on to any commercial online service that has an Internet gateway. With familiar interfaces, convenient local access numbers, and millions of users, these services offer a simple way to get your infobahn training wheels.

All online services are not created equal, however. They range from the relatively useful to the brain-dead. Of the major services, America Online and Delphi offer the best Internet access, and of these two, we'd choose America Online. Although its Internet tools are more limited than Delphi's, and it's slow with most Internet chores, AOL's interface is easier to use—and at this level, ease of use is what counts.

America Online. Sending E-mail from AOL is extremely easy—just click on the Mail Gateway icon in AOL's Internet Center, then compose and address your message. The service has gone out of its way to explain everything, including descriptions of



AMERICA ONLINE'S INTERNET CENTER is easy to use but limited in the tools it gives you. Web access is in the works, however.

Flame: To insult and abuse another user, usually in retaliation for breaches of netiquette.

FTP: A method for moving files across the Net; not to be confused with FTD, a method for moving flowers across the country.

what Internet addresses mean and how to use the Net to send mail to other online services. Subscribing to mailing lists from AOL is similarly simple.

Sometimes AOL's urge to demystify the Internet goes a little overboard. In the newsgroup section, for example, AOL has tried to simplify the process of subscribing to Usenet newsgroups by describing groups ("Media, technology and information in domestic spaces") instead of just supplying their Internet names ("comp.home.mis"). This actually ended up confusing rather than helping our testers. Also, access to the newsgroups is unreliable; attempts to connect to many newsgroups resulted only in a message that the group was "unavailable."

Finding Internet files from AOL is a hit-or-miss proposition. AOL offers Gopher and its companion search tool, Veronica, and has done a nice job of putting "Editor's Choice" Gopher finds (such as the entire 1994 U.S. budget) on easy-to-use menus. But independent forays into Gopherspace often resulted in 'Internet error' messages instead of files, and performance was extremely slow when we did get through. AOL has been promising to add Web access and to implement FTP and telnet, but at press time it hadn't yet done so.

Delphi. We had great expectations for Delphi—after all, its official name these days is Delphi Internet Services. In fact, it does offer more Internet tools than any other major online service. In addition to E-mail, Delphi lets you browse Usenet newsgroups using Delphi's own newsreader or the popular UNIX-derived NN tool; we were able to subscribe to most of the newsgroups we tried. You can also find files via FTP (with Archie file searching) or Gopher (with Veronica searching). We found Delphi's Gopher access far more consistent than AOL's. Even more impressive, Delphi has a connection to the Web.

Unfortunately, to get to any part of the Internet from Delphi, you must wade through a crude text interface only a DOS user could love. Navigating between various Internet services means typing in the number of a menu selection or using a CompuServe-style Go command. Delphi recently teamed up with Phoenix Technologies to release a Windows front end called InterNav. (A $29.95 starter kit called Phoenix Internet Express includes the InterNav software, a Delphi account with 10 free hours, and Delphi and Internet guidebooks.)

With familiar interfaces, convenient access numbers, and millions of users, online services offer a simple way to get your infobahn training wheels.

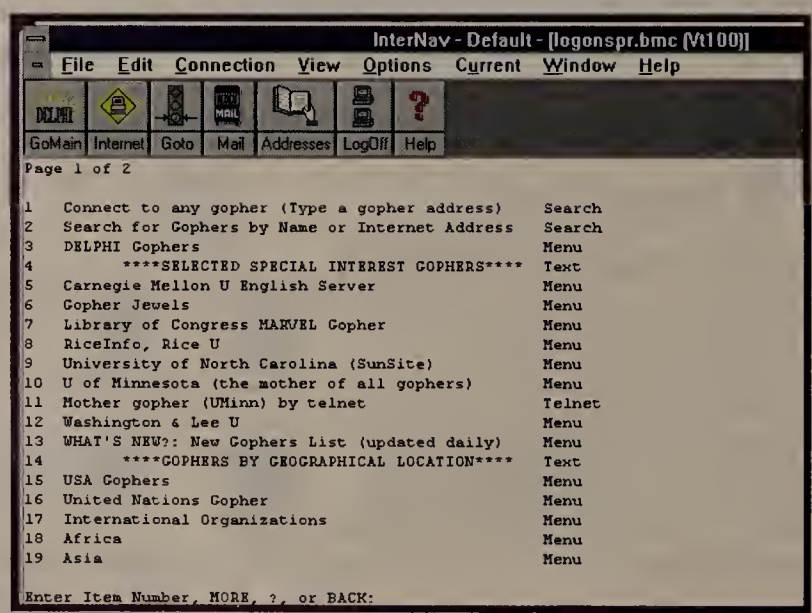
But InterNav is little improvement over Delphi's basic text prompts: You point and click on the same text-based menus, an often frustrating process. Not surprisingly, our testers found InterNav lacking, particularly once they'd seen AOL's slick Windows look. They found the basic Delphi interface and InterNav software awkward and difficult to handle; as a result, they had a generally low success rate with the Internet tasks we assigned them.

CompuServe. If you're one of CompuServe's two million subscribers, your Internet access is currently limited to E-mail. But the 800-pound gorilla of the commercial online world has plans to enhance its Internet service. CompuServe recently implemented its gateway to Usenet newsgroups, with telnet and FTP services planned for late 1994. (The company also said it plans to introduce a dedicated Internet access service, but at press time no schedule had been announced.)

Judging from what we've seen so far, CompuServe needs to work out some kinks with its Internet access. While E-mail is reliable enough, we found access to Usenet newsgroups inconsistent. The list of available newsgroups was small, and those we did find were often short on postings. CompuServe does have one big advantage over the other online services: With more than 300 local access numbers around the United States, CompuServe has possibly the most widely available Internet gateway. And remember, the quality of your Internet connection from CompuServe depends heavily on which of the many CompuServe interfaces you use.

Other Online Services. Beyond AOL, Delphi, and CompuServe, links from online services to the Internet are generally limited. Prodigy, GEnie, and MCI Mail offer E-mail gateways to the Internet, but that's about it. Keep your eyes open, though. This market is changing quickly. In addition, many local bulletin board systems (BBSes) now offer Internet E-mail and Usenet news.

COMPUSERVE'S INTERNET GATEWAY gives you limited access to Usenet newsgroups and E-mail, but that's about it.



DELPHI'S WINDOWS INTERFACE, INTERNAV, tries to put a prettier face on Delphi's text prompt. The effort is only partly successful.

Mosaic: Most popular Web interface.

Jughead: A utility for searching Gopher servers, smarter than its cartoon namesake.

Gopher: A utility that tunnels between computer networks in search of information.

HOW TO FIND A SERVICE PROVIDER

Unless you go with an established online service like AOL or CompuServe, you're going to have to find a dedicated Internet service provider. That's not a trivial task. According to the Internet Network Information Center (InterNIC), there are some 160 commercial access providers around the country. How do you find one? The best sources are online. InterNIC publishes a list of providers that you can get by anonymous FTP (at is.internic.net, look in the /infoguide/getting-connected/united-states directory for the INTERNIC-LONG file), E-mail (to info@internic.net), or downloading it from America Online or CompuServe (it's in PC World Online's forums on both services and the Internet Forum on CompuServe). You should also take a look at Peter Kaminski's PDIAL list. Send E-mail to info-deli-server@netcom.com; in the subject or body of the message type send pdial. When searching for a provider, you should also check local sources: ads in local computer magazines, staff at computer stores, and members of local user groups.

Once you have a list of local possibilities, call each and ask a few pertinent questions. How much does it cost? Be sure to find out *all* the charges—monthly, hourly, surcharges for peak usage, storage, discounts for off-peak usage, and toll-free access. Some providers even charge for letting you receive E-mail. Is high-speed access (14.4 kbps and up) extra? If you're getting a shell account, do you have to pay extra for the software? Will it be a local call or long-distance? Will you be connecting through a packet carrier such as SprintNet or Tymnet? If so, you may have to pay for the privilege.

If you're opening a shell account, find out which Internet tools you get; at a minimum, you want E-mail, a newsreader, FTP, Gopher, Archie, Veronica, and some sort of Web browser. If it's a SLIP/PPP account, find out what kind of documentation you get—you want all the details you need to configure your TCP/IP software. What about tech support? When is it available?

How's the access? Your provider should support 14.4 kbps at a minimum, 28.8 kbps if possible. What are the peak usage hours? How long does it take to get through during peak, evening, and weekend hours? The answer you want is "immediate," but less than 5 minutes is acceptable. Ask if there are times when you can expect *not* to get through. What is the capacity of the provider's outgoing connection to the Internet backbone? If it's less than a T1 line for a local system or a T3 line for a regional or national provider, keep looking—you're likely to encounter better performance elsewhere.

THE COST OF ACCESS

	KEY FEATURES			MONTHLY USAGE				
	Area covered	Setup fee	Terms [1]	10 hours	40 hours	100 hours	Sales/information number	Reader service
ONLINE SERVICES								
America Online	nationwide	$0	$9.95/mo., $2.95/hr. after 5 hrs.	$24.70	$113.20	$290.20	800/827-6364	685
CompuServe	nationwide	$0	$8.95/mo., $9.60/hr.	$104.95	$392.95	$968.95	800/848-8199	686
Delphi Internet Services	nationwide	$0	$20/mo., $1.80/hr. after 20 hrs.	$20	$56	$164	800/695-4005	687
SHELL ACCOUNT PROVIDERS								
NeoSoft with UNIX shell	Texas, Gulf Coast	$20	$19.95/mo.	$19.95	$19.95	$19.95	713/684-5969	688
Netcom with NetCruiser interface	nationwide	$25	$19.95/mo., $2/hr. after 40 hrs.[2]	$19.95	$19.95	$139.95	800/501-8649	689
Netcom with UNIX shell	nationwide	$20	$17.50/mo.	$17.50	$17.50	$17.50	800/501-8649	690
Pipeline with Pipeline interface	New York[3]	$0	$20/mo., $2/hr. after 20 hrs., or $35/mo.	$20	$35	$35	212/267-3636	691
SLIP/PPP ACCOUNT PROVIDERS								
California Online	California	$20	$25/mo., $.50/hr. after 90 hrs.	$25	$25	$30	707/586-3060	692
Connix: The Connecticut Internet Exchange	Connecticut	$20	$25/mo., $1/hr. after 20 hrs.	$25	$45	$105	203/349-7059	693
HoloNet	California[3]	$75	$2/hr.[4]	$20	$80	$200	510/704-0160	694
Internet Atlanta	Georgia	$10	$1/hr. (std.); $.75/hr. (budget, 100 hrs.)	$10	$40	$75	404/410-9000	695
NeoSoft	Texas, Gulf Coast	$40	$39.95/mo.	$39.95	$39.95	$39.95	713/684-5969	696
Portal Information Network	nationwide	$19.95	$19.95/mo., $.95 to $2.95/hr.	$29.45	$57.95	$114.95	800/433-6444	697
PrimeNet	Southwest	$30	$20.95/mo.[5]	$20.95	$20.95	$20.95	800/463-8386	698
Performance Systems International	nationwide	$200[6]	$29/mo., $2/hr. after 29 hrs.	$29	$51	$171	800/774-3031	699

[1] Assuming local access.

[2] Peak-hour usage, 9 a.m. to midnight weekdays; unlimited usage during off-peak hours.

[3] Available nationwide at higher rates.

[4] Off-peak usage, 5 p.m. to 8 a.m.; peak-hour rates double. Minimum $6/mo.; $1/MB of data transferred.

[5] $24.95/mo. in Los Angeles.

[6] Includes three free months, copy of NetManage Chameleon.

For more information about all services in this table, circle reader service no. 908.

Netiquette: How your grandmother would tell you to act if she were online.

Newbie: A new Internet user; often considered flamebait by unsympathetic Net vets.

Newsgroup: An electronic discussion group.

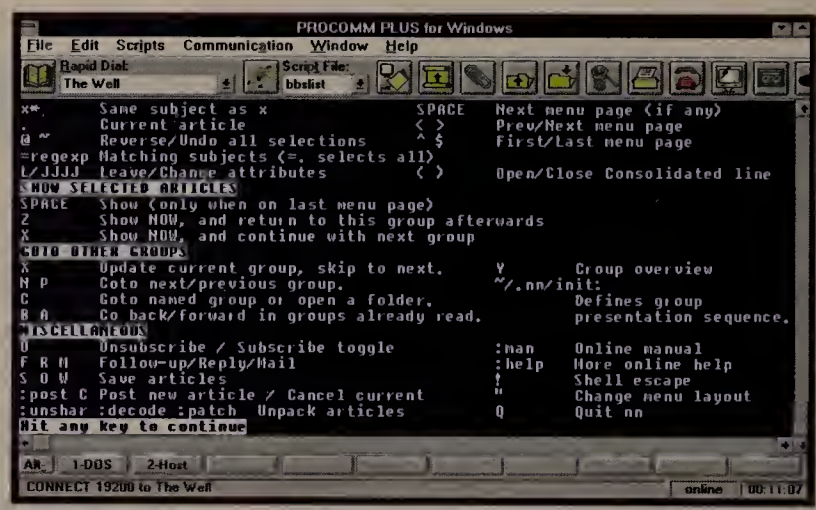
Option 2: Shell Account

None of the online services offers a full suite of Internet tools, and all of them limit your access to Usenet newsgroups and file sites. So if you want better tools and more complete access, you need to go to a specialized Internet service provider.

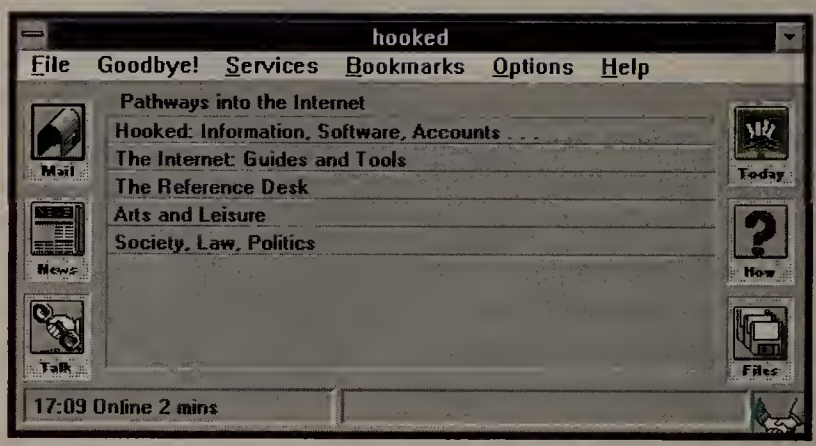
According to InterNIC (Internet Network Information Center), there are currently more than 130 commercial Internet access providers in the U.S. (See "Guide to Getting Started" for details on acquiring a copy of the InterNIC list.) These range from national companies such as Netcom and PSI—which have local access numbers all over the country—to mom-and-pop operations that cover only one area code. If you're lucky, you may also be able to use one of the many local "Free-net" providers, nonprofit community groups that offer low- or no-cost access.

Most commercial access providers will sell you a shell account, a Serial Line Internet Protocol service, or a Point-to-Point Protocol (a newer version of SLIP) service.

Shell accounts have the advantage of being the cheapest Internet connection you can make. You can get a shell account for as little as $10 a month, which buys you either a set number of hours online each month or, more commonly, unmetered usage. Using a shell means dialing into the access provider's computer and using that provider's interface to the Net. These interfaces range from the forbidding UNIX command lines to elaborate, custom-designed menus; you usually get the interface software at no charge when you set up your account.



SHELL ACCOUNT INTERFACES range from raw command lines...



...to proprietary Windows front ends such as Pipeline.

NetCruiser from Netcom is an excellent example of interface software. It was the hands-down favorite of our first-time Internet users. While NetCruiser supports a robust selection of Internet tools, it's also easy to use. After you dial in, icons guide you to the most popular Internet utilities—a buck-toothed rodent for Gopher, a spider web for World Wide Web. Our testers had no problems using NetCruiser's E-mail, newsgroups, or FTP, but many were baffled by its implementation of Gopher. After clicking the Gopher icon, you see a map of the United States, which you must click to choose a

GUIDE TO GETTING STARTED

To start out, you need a few good books. My two favorites are *The Whole Internet User's Guide and Catalog* (O'Reilly & Associates, Sebastopol, California, 1992) and *New Riders Official Internet Yellow Pages* (New Riders, Indianapolis, 1994). After that, the Net itself is the best information source. But be warned: File names and locations are subject to change.

When you're told to use anonymous FTP, use your FTP tool to connect to the site listed, then log in as anonymous and give your E-mail address as the password (for example, joe_abernathy@pcworld.com.)

For a current list of anonymous FTP sites: Anonymous FTP to ftp.shsu.edu, move to the /doc/doc-net/ftp-list directory, and look for the sitelist file.

For a list of special-interest mailing lists: Anonymous FTP to usc.edu, log into the directory /net-resources, and look for a file named interest-groups.

For lists of Frequently Asked Questions (FAQs): Anonymous FTP to nic.merit.edu; retrieve the file /documents/fyi/fyi_20.txt. Get these answers first; asking an FAQ in a newsgroup is the online equivalent of taping a Kick Me sign to your forehead.

For a list of World Wide Web service providers: Anonymous FTP to ftp.einet.net and then go to the directory /pub/INET-MARKETING/www-svc-providers.

To download a copy of *The Big Dummy's Guide to the Internet*, anonymous FTP to ftp.eff.org.

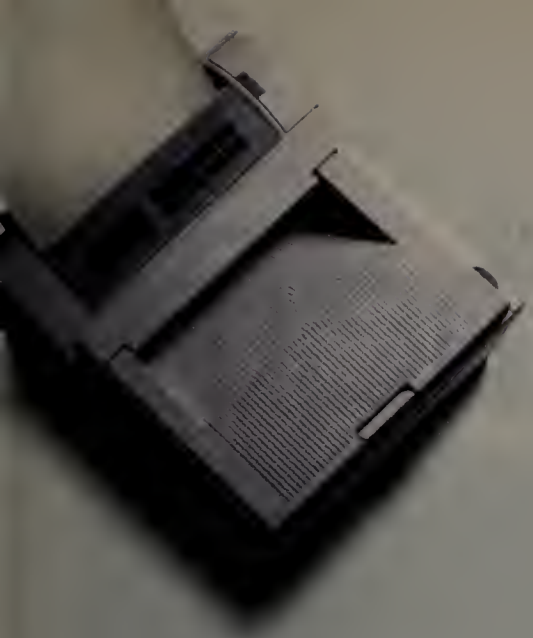
For the InterNIC Directory and Database Services, which include descriptions of many network destinations: Send E-mail to admin@ds.internic.net.

For the Yanoff List, an index of newsletters and related information sources, subscribe to the Usenet newsgroup alt.internet.services; retrieve the file inet.services.txt by means of anonymous FTP from csd4.csd.uwm.edu in the /pub directory; or send E-mail to bbslist@aug3.augsburg.edu.

For the latest Gopher sites, send E-mail to listproc@einet.net and type subscribe gopher-jewels *your name* in the body.

The Net Happenings mailing list gives updates on new information sources. Send E-mail to majordomo@is.internic.net and type info net-happenings in the body.

PPP: A type of account that provides direct access to the net. Requires TCP/IP software. SLIP: An older type of direct access account (see PPP). T1, T3: High-speed phone lines, used to hook LANs to the Net.



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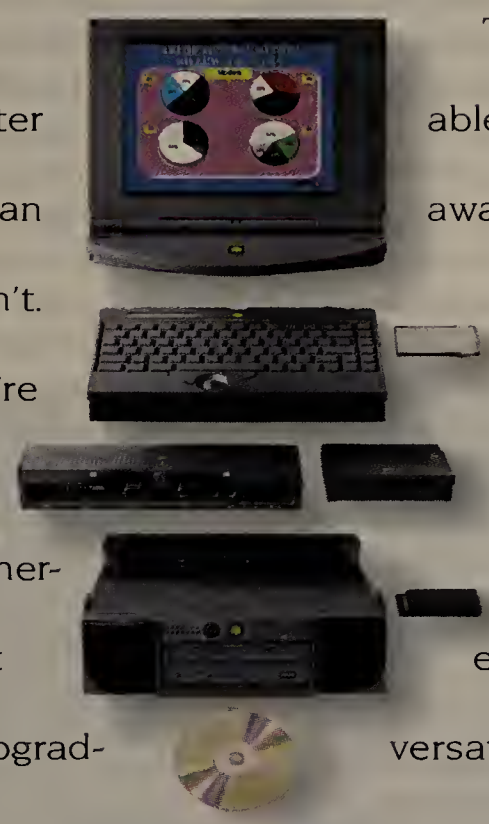

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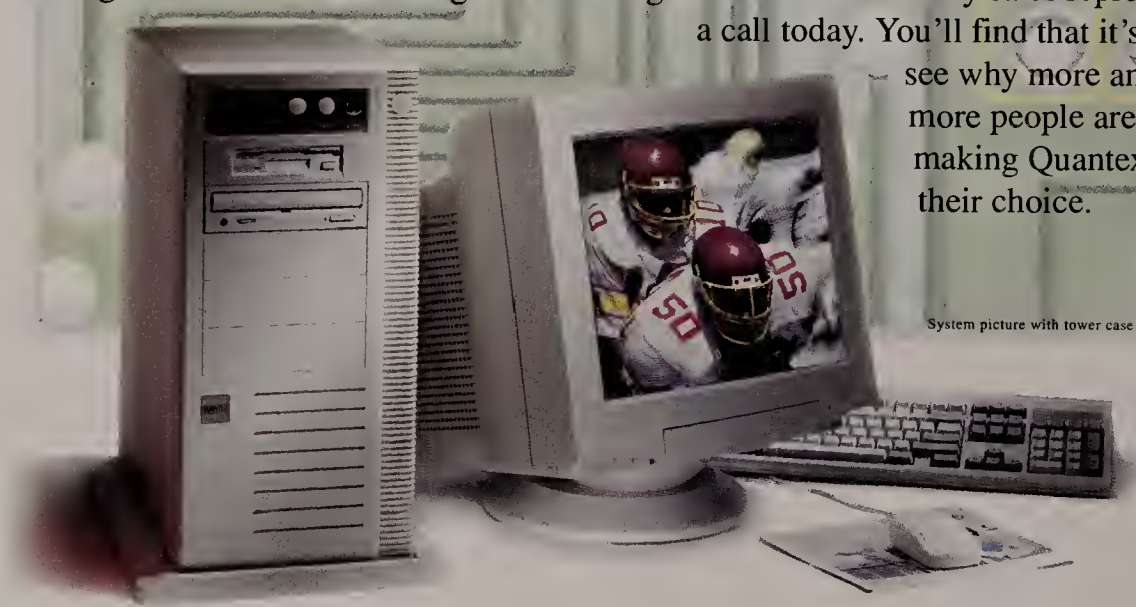

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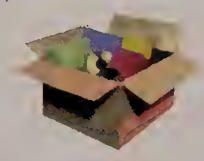

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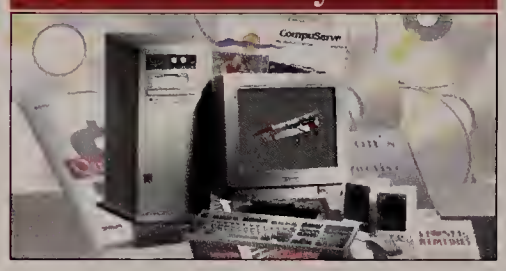

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*All Pentium systems come with 256KB cache; 486DX2/66 systems come with 128KB cache standard. WordPerfect MainStreet select includes WordPerfect Works, InfoCentral, ClipArt, Grammatik, Random House Webster's School & Office Dictionary, and Wallobee Jack: The Lost Lionardo. PerfectOffice software includes WordPerfect 6.1, Quattro Pro, Presentations, InfoCentral, Envoy, and Groupwise. Some software packaging may be cosmetically different than pictures shown. Quantex accepts prepaid checks, Visa, MasterCard, Discover, and American Express. Purchase orders from government agencies, universities, and Fortune 1000 companies also accepted. Call for details regarding Quantex's money-back guarantee, warranty, and 4-year on-site service option. On-Site Service may not be available in certain remote areas. All returned items must have a Return Merchandise Authorization (RMA) number and must be in original packaging. The cost for returned freight is not included with any Money-Back Guarantees; shipping charges are non-refundable. Prices and product descriptions subject to change without notice. Quantex Microsystems cannot be responsible for errors in typography or photography. Due to volatility of prices, Quantex does not offer a price protection policy. The Intel inside Logo, Intel486, IntelDX2, OverDrive, and Pentium are trademarks of Intel Corporation. Some of the names or trademarks shown herein may be the property of other companies. Screen images simulated.

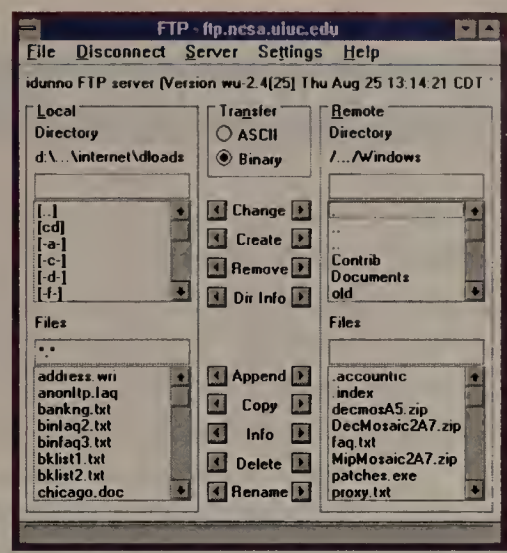
Net suite on the market, if only because it has been around the longest. Many access providers offer it as their default TCP/IP suite, and it's bundled with many book-and-disk packages. But with a price tag of $199, Internet Chameleon isn't competitive with the more fully featured Internet in a Box or the budget-priced Internet Membership Kit.

Other vendors are joining the Internet suite market all the time. Frontier Technologies, which sells the network-oriented SuperTCP for Windows, is producing a version of the software for the single-user market. Quarterdeck is also expected to come out with an Internet product shortly.

Have It Your Way

Installing a suite makes TCP/IP relatively painless, but that convenience will cost you money. If you're looking for a cheaper alternative, you can assemble a full-powered Internet tool kit by downloading the TCP/IP software and its attendant utilities from the Internet or an online service. You can put together a suite of Windows Internet tools for as little as $20 in shareware registration fees (see "Top Tools for the Internet").

Unfortunately, this roll-your-own strategy can be a nasty business. Even after you've acquired your software, you need to configure it so that it will work with your SLIP/PPP account. That means dealing with a bunch of networking arcana—IP addresses, domain name servers, and subnet masks—from which the all-in-one suites shield you. While some service providers will assist you, others won't. And when you take the freeware/shareware route, you may be stuck with minimal technical support from your software vendor as well.



FILE TRANSFERS: A point-and-click affair with Spry's Internet Membership kit.

If such challenges don't daunt you and you use Windows, you should know about Winsock (Windows Sockets), an industry standard for connecting Windows to TCP/IP. At the time this article went to press, a package called Trumpet Winsock was available on America Online and CompuServe; other Winsocks litter the Net. Winsock-compatible tools for E-mail, FTP, and other Internet activities are available from the same sites.

In addition to all the shareware and freeware, we're starting to see an increasing number of commercial utilities. One of the best is Qualcomm's E-mail program Eudora, which lets you customize filters and folders so you can sort all your messages before you read them. Other commercial products are less compelling. Ameritech's WinGopher, for example, is great, but other programs nearly as good are available as freeware. Commercial versions of Mosaic are also on the way. These will be enhanced with all sorts of bells and whistles, but a free version of Mosaic is always available via FTP from the National Center for Supercomputing Applications.

Another way to get TCP/IP is to upgrade to Windows NT 3.5, OS/2 Warp version 3.0, or wait for the release of Windows 95. All three have TCP/IP built in. The first version of Windows 95 we looked at offered only minimal TCP/IP connectivity, along with primitive FTP and telnet utilities. IBM's Warp, on the other hand, includes a well-designed Internet on-ramp (see "Second Look: Windows 95," November 1994). It's not too tough to configure, and it offers one of the better Usenet newsreaders we've seen. In addition, it's compatible with Winsock,

TOP TOOLS FOR THE INTERNET

For me, the best way to get onto the Internet is with a robust base package, such as NetManage's Internet Chameleon, to which you add tools to meet particular needs. If I could construct an ideal Internet tool kit, I'd mix and match utilities from different packages. So, here's my fantasy suite. Some of the modules aren't available as stand-alone products, but, hey, it's my fantasy.

CORE CONNECTIVITY: Internet Chameleon, NetManage Inc. Much as I admire the Air Series from Spry, I use Netmanage's Chameleon TCP/IP stack because it's been tested with the widest variety of third-party applications. Also, you can configure it to work with multiple service providers, which can be important on the road.

E-MAIL: Eudora, Qualcomm Inc. Eudora's smart filtering, ability to attach a variety of file types (including sound, graphics, and video) to mail messages, and generally good organization make short work of massive E-mail chores. A freeware version of Eudora is available via anonymous FTP from ftp.qualcomm.com in the directory /quest/windows/eudora.

NEWS READER: Air News 3.0, Spry. Threaded discussions, personal newsgroup folders, and an intuitive interface make it a winner.

FILE TRANSFER PROTOCOL (FTP): Network File Manager, Spry. Onetime UNIX nightmare is now reduced to the drag-and-drop simplicity of Windows' File Manager.

TELNET: Internet Chameleon. Clean.

GOPHER: Internet Chameleon. The best all-around job in a close race.

WORLD WIDE WEB BROWSER: AIR Mosaic, Spry. Automatic configuration alone makes it worth the price of the Internet in a Box suite.

ARCHIE: WSARCHIE, David Woakes. Freeware file locator utility available via anonymous FTP from the site ftp.demon.co.uk in the directory pub/ibmpc/winsock/apps

Veronica: A tool for tracking down information stored on Gopher servers; Betty's buddy.

Winsock: Windows Sockets. The standard interface between Windows and TCP/IP; what Bill Gates wears under his Winshoe.

FROM CONSUMER TO PROVIDER

You've done E-mail. You've burrowed with Gopher. You've FTP'd files until your hard drive was full. Perhaps now you're ready to turn the tables and become an information provider.

One of the easiest ways to build online awareness of your company is to establish an electronic mailing list. Your company's list might include software updates, special offers, and discussions among customers about how to better use your product. You can establish a one-way mailing list by setting up an alias in an E-mail package like Eudora, which lets you send a message to many recipients. To establish a full interactive discourse with customers, you'll need a public alias—an address to which anyone can send mail and have it routed to everyone on the mailing list.

Another option is to set yourself up as an FTP server. This lets you use your computer to distribute files to people you choose. You can use a tool such as the FTP server utility, which comes bundled with NetManage's Internet Chameleon, to let others download files from you. (Spry's Internet in a Box has no comparable feature.)

Establishing a home page on the World Wide Web is the most exciting—and also the most involved—approach to making your presence known. Of course, someone has to create the multimedia content for you and package it into a form recognizable by Mosaic, or you'll have to do it yourself using shareware tools found on the Net. You'll need a *hypertext markup language editor* to transform documents into hyperlinked Web pages. (My favorite, HTML Assistant Pro by Howard Harawitz, is available as shareware for $59; contact harawitz@fox.nstn.ns.ca.)

so you can plug in any Winsock-compatible utility. And an OS/2 version of Mosaic will be released in the first quarter of 1995.

Option 4: Connect Your LAN

While our focus so far has been on individual users, the fourth option is the optimal solution for groups. If enough of your coworkers want to get wired—and if you can convince the MIS department to play along—connect your LAN through a high-speed link to the Net. With this kind of direct link, the Internet becomes a gigantic extension of your company's existing network. Expect to pay the price for a dedicated link between your network and a local access provider, however. Costs start around $130 a month for 14.4 kbps, going up rapidly from there.

Once you're wired, you still need to install TCP/IP and its tools in each system on the LAN. Scads of commercial TCP/IP packages are aimed at network environments. For example, Spry and NetManage make network-level TCP/IP products called the Air Series and Chameleon 4.0, respectively. You install these products on the system administrator's PC, then put Internet Chameleon or Internet in a Box on individual users' machines.

Where the Rubber Meets the I-Way

So which of these four options is right for you? If all you want is E-mail and some Usenet newsgroups, an online service should be fine; we prefer America Online.

If you want more Internet tools and fewer 'Internet error' messages, you need to set up an account with a dedicated Internet provider. If price is paramount, try a shell account. If you're lucky, your provider will have a decent-looking interface; if you're not, be prepared to live with a simple command line. Of the interfaces we looked at, we were particularly impressed with Netcom's NetCruiser.

But in our opinion, the best choice for Internet access is to install TCP/IP on your system (or LAN) and set up a SLIP or PPP account with a local dedicated access provider. One of the new all-in-one TCP/IP suites is a great way to start.

If cost were not an issue, we'd choose Spry's Internet in a Box; it's packed with goodies, and it configures easily. For a cheaper introduction to the Net, try the Internet Membership Kit from Ventana Media. As you gain experience, you can customize your setup with shareware, freeware, or commercially available utilities. Then you can use your newfound Net savvy to lobby the MIS folks to hook the LAN to the I-way.

One last bit of advice: Once you've gotten on the Net, start exploring. Everywhere you look, you'll find new tools, information on cool Internet resources, and millions of fellow surfers. Welcome to the neighborhood.

PC World *senior editor Joe Abernathy earned the* Houston Chronicle'*s Pulitzer Prize nomination in 1993 for coverage of the Internet. He is executive director of the Houston Free-Net Organizing Committee. Daniel Tynan is a contributing editor for* PC World. *Special thanks to Paul Wilson of InterNIC.*

For more information about all products and services in this article, circle reader service no. 912.

WHERE TO BUY

Eudora $65; Qualcomm Inc., 800/238-3672
Reader service no. 759

HTML Assistant Pro $59; Howard Harawitz, 902/835-2600
Reader service no. 760

Internet Chameleon $199 (LAN version $495); NetManage Inc., 408/973-7171
Reader service no. 761

Internet in a Box $149; Spry, 800/557-9614 ext. 26
Reader service no. 762

Internet Membership Kit $69.95; Ventana Media, 800/743-5369
Reader service no. 763

Phoenix Internet Express $29.95; Phoenix Technologies/Delphi, 800/452-0120
Reader service no. 764

Spry Air Series $199 to $449; Spry, 800/777-9638 ext. 26
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SuperTCP for Windows $395; Frontier Technologies, 800/929-3054, 414/241-4555
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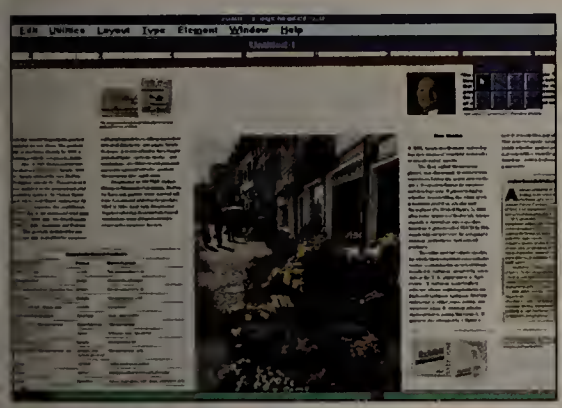

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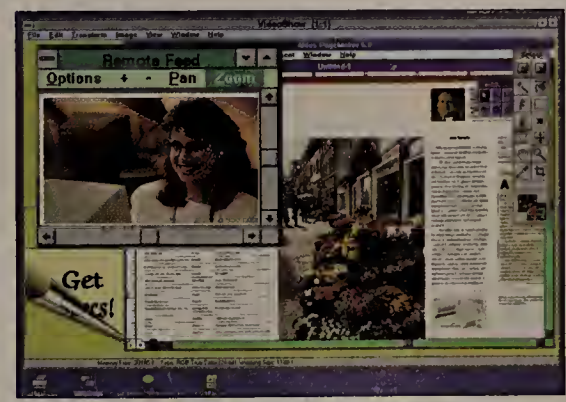

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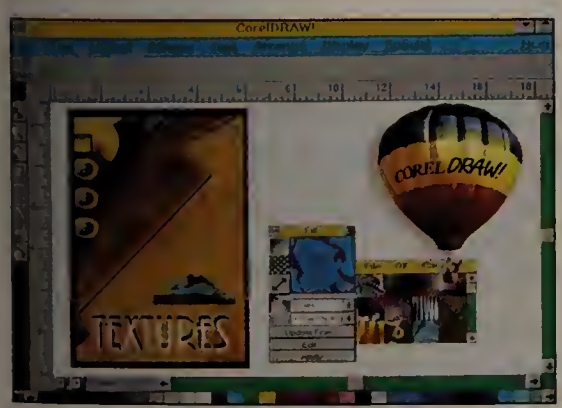

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WHAT YOU SAY Is What You Get?

Voice recognition software lets your voice—not your fingers—do the typing. Our reviewer puts three promising new packages to the test. BY DANIEL TYNAN

No less a visionary than Jerry Seinfeld summed it up in a recent issue of *Esquire* magazine. "At the speed technology is going," he said, "it's only a matter of time before you can just talk to [a computer] like a person. Tell it what you want. 'Do this, do that.' You won't even have to type. It can't be more than 15, 20 minutes away."

Ah, Jerry, if you only knew. Thanks to major advances in speech recognition software, you don't have to wait another minute to talk to your PC. The interface of the future is here today, and it promises to radically alter the way we work. Sophisticated speech recognition systems can help executives and lawyers draft documents and let busy medical and manufacturing professionals take

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notes when they're away from the keyboard. Such software may even bring PCs into the homes and offices of computer neophytes and others who seem downright allergic to typing.

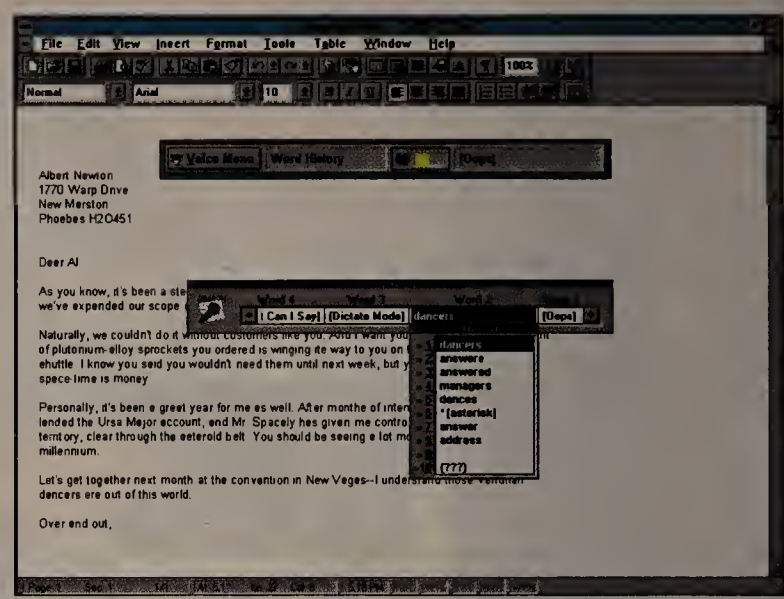
But speech recognition software also offers real hope to those who cannot use a traditional keyboard and mouse. For the thousands of office workers suffering from repetitive-strain injuries, this technology can help them return to work. The software can also help disabled users who don't have full use of their hands take full advantage of PC applications. And voice input has a visceral appeal for millions of PC users who see it as a more natural way to create documents and issue commands.

Think about it for a moment. No more typing. No more electronic vermin scurrying across your desktop. Just the calm, measured tones of a human voice, telling a machine what to say and do. You know—the way it's supposed to be.

Voice Input: The Next Generation

Speech recognition technology has actually been around since the mid-1980s, but the products were inaccurate, cost thousands of dollars, and required specialized systems such as IBM RS6000 workstations.

Times, and technology, have changed. New speech recognition products work under Windows and OS/2 on standard PCs, thanks to improved recognition algorithms and powerful CPUs and digital signal processors (DSPs). For around $1000 you can get a DSP-based sound board, a headset microphone, and full-featured dictation software that recognizes as many as 30,000 words—a vocabulary large enough to let you wax poetic in memos, letters, and other documents.



JUST SAY "OOPS" to bring up DragonDictate's word history window—it lets you correct up to the last 32 words you spoke. Unfortunately, you can't see more than 4 or 5 words at a time.

I looked at three packages that represent the state of the art in PC speech recognition: DragonDictate, Kurzweil Voice, and IBM VoiceType Dictation for OS/2. The first two are Windows programs; the latter lives (as the name suggests) in OS/2, although a Windows version shipped after our test deadlines.

I installed each system on a Micron 486DX2-66 with 32MB of RAM. Then, armed with nothing but my vocal cords and a headset microphone, I put them through their paces. I dictated a business letter, filled out an expense report using a spreadsheet, and tidied up my desktop by shuffling files, resizing windows, and so on. I performed all the tests in both a quiet and noisy room. I then compared how long it took to complete the tasks using my voice versus using the keyboard.

What did I find? Voice recognition software has enormous potential, but it's still rough around the edges. All these programs force you to speak with pauses between words—a method that's known as *discrete speech*. And you'll need a great deal of practice, patience, and discipline before the process of voice input becomes, well, as natural as talking.

DragonDictate 1.0 for Windows

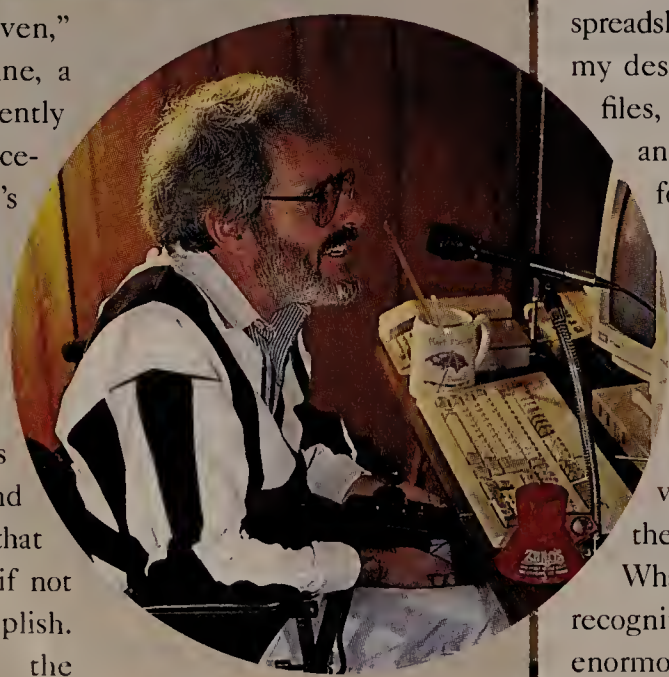
DragonDictate is the wizened veteran of speech recognition software, having been available for DOS programs such as WordPerfect and Lotus 1-2-3 since 1990. Dragon Systems sells a $695 Starter Edition with a 5000-word vocabulary, but serious dictation demands the $995 Classic Edition, with a 30,000-word vocabulary, or the $1995 Power Edition, with 60,000 words. Prices include an IBM M-ACPA sound board costing about $300; however, DragonDictate is the only software that works with third-party sound boards.

DragonDictate's mildly tedious 30-minute "enrollment" session consisted of reciting lists of words so the program could adapt to my distinctive brand of mumbling. Then I launched my word processor and bellied up to DragonDictate's clever VoiceBar—a skinny horizontal window that floats on top of applications. The VoiceBar tells you if your microphone is on, displays the last word DragonDictate heard, and indicates whether you're in command mode (for controlling applications) or dictate mode (for dictating text into documents).

DragonDictate's separate modes make it easy to access drop-down menus—I just switched to command mode by saying "command mode," and said "file open" to open a word processing file. But I kept forgetting which mode I was in—this caused me to issue commands while DragonDictate was taking notes, and to dictate text while the program was listening for orders.

PROFILES IN VOICE RECOGNITION

"I'm in seventh heaven," says Dave MacFarlane, a quadriplegic who recently began using IBM VoiceType Dictation. "It's liberating. It allows me to accomplish things that I never could before." Now he roams cyberspace, writes letters, pays his bills, and sends and receives faxes—tasks that were once difficult, if not impossible, to accomplish. However liberating the VoiceType software has proven to be, though, MacFarlane says he's hoping the next upgrade will make it possible to turn the system on and off by voice, rather than by clicking an icon.



NAME: Dave MacFarlane

OCCUPATION: Retired software engineer, Honeywell Information Systems

WHERE: Monroe, Connecticut

VOICE RECOGNITION SYSTEM: IBM VoiceType Dictation for OS/2

When I said "file open" in dictate mode, DragonDictate inserted the words *file open* into my document.

Dictating text using this program is trickier than typing. As you say each word, DragonDictate inserts it into the document and provides a list of up to ten sound-alike words in a drop-down window. If the correct word pops up at the top, you continue dictating; but if the word appears further down the list, you have to choose the appropriate sound-alike. If the right word isn't listed, you must spell it out using the international communications alphabet ("alpha, bravo, charlie") or type it with the keyboard.

Thankfully, DragonDictate modifies the word list as you spell, and usually arrives within two or three letters of the right word. But you'll need to fix mistakes as they happen—DragonDictate tracks only the last 10 to 32 words spoken, which makes it easy to lose your train of thought. If you like, you can dictate the entire document and fix errors later, but then DragonDictate doesn't adapt itself to your voice.

Unfortunately, DragonDictate proved a little less accurate than either Kurzweil Voice or IBM VoiceType Dictation. The first time I dictated my letter—reciting the text without pausing to make corrections—the program flubbed almost one out of four words. When I dictated the letter again and stopped to fix errors, accuracy improved slightly, but it took four times as long to do. And it was still three to four times slower than typing the letter by hand. While DragonDictate improved with practice, it never matched either Kurzweil Voice or IBM VoiceType Dictation.

Where DragonDictate stands out the most is in its simple, hands-free operation, which makes it the best choice for those who can't use a mouse or keyboard. Only DragonDictate lets you control the mouse pointer with your voice—a big help in navigating a graphical interface. You can send the pointer scurrying in any direction, control its speed, and click and drag objects.

You get similar control over the cursor. Say "move left," and the cursor ambles westward until you say "stop"—a helpful tool for exploring huge spreadsheets. But DragonDictate consistently heard "up" when I said "left," which made filling out an expense report even more frustrating than usual.

PROFILES IN VOICE RECOGNITION

NAME: Oliver Schubert

OCCUPATION: President and developer of Casino Software and Services

WHERE: Las Vegas, Nevada

VOICE RECOGNITION SYSTEM: Self-designed Blackjack Survey Voice, based on DragonDictate

Software designer Oliver Schubert knew it was a sure bet. While plenty of programs help a player win, he found none to help a casino spot card counters. So he came up with the Blackjack Survey Voice program, based on DragonDictate software. His player evaluation program is straight out of a James Bond film. Casinos regularly monitor activities at the blackjack tables through "eye-in-the-sky" cameras. In the past, a surveillance team would watch the action as cards were dealt, plays made, and bets wagered. "That was an ineffectual way to spot counters," says Schubert. "With our voice recognition program, casino workers can keep their eyes trained on the gamblers and speak the plays into the computer." The computer, using Schubert's software, analyzes the data on card players' actions and identifies card counters, whom the casinos can then legally bar. Already The Mirage, Treasure Island, Tropicana, and other top casinos are using this method of weeding out cardsharps.

ADVENTURES WITH THE SINGING COMPUTER

My aversion to dictating may once have driven a man to drink. For a moment in my brief bureaucratic career, the central office must have regarded me as a rising star, and it sent me the perfect secretary. Unlike the other secretaries in that organization, he could actually take shorthand rapidly, transcribe it accurately, and spell the words correctly.

He could take it, but alas, I couldn't give it. After just one tormented attempt to dictate a memo to him, I retreated to scribbling things on a yellow pad for Jimmy to type. Since he had no chance to show his skills, his self-esteem must have plummeted until he tumbled disastrously off the wagon.

Even when writing about computers or other prosaic matters, I write in so deep and concentrated a silence that any spoken word—including my own—shocks me out of my train of thought. Nonetheless, in exchange for a sizable fee I allowed *PC World* to take away pen, pad, quietude—and even, the editors thought, keyboard. They replaced these tools with a supercharged PC with 32MB of RAM, a sensitive headset microphone, and Kurzweil Voice 1.0 for Windows, and said I should try to write by dictating to that. The software's name did intrigue me: Kurzweil reminded me of Kurt Weill, composer of *The Threepenny Opera*. I

renamed the infernal machine the Singing Computer, and kept hoping that once we felt comfortable together, it would break into an electronic rendition of "Mack the Knife."

After I logged on, Kurzweil prompted me to speak. In its initiation mode, it doesn't know "hello," only commands (listed in the docs). So, following the in- *continued on page 152*

PROFILES IN VOICE RECOGNITION

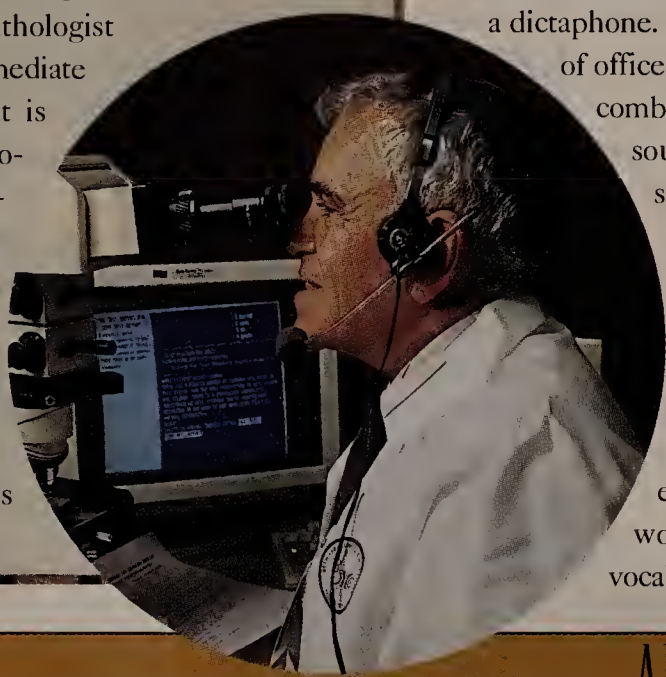
Carl Teplitz, Beth Israel Medical Center's pathology chair, has been so delighted with Kurzweil's voice recognition program that soon his entire department—some 400 employees—will be using it. "Our hospital is incredibly busy," says Teplitz. "It's vital to return a diagnosis as quickly as possible. However rapid our pathologists were, it would take from two to three days to have a report transcribed." Now the interval between the time that a doctor receives a specimen and the time the report is filed averages 18 hours. In addition, the program gives the pathologist complete and immediate control over what is dictated. "Pathologists are very compulsive people," explains Teplitz. "When they depend on other people, it's hard [for them] to get a report exactly as they like."

NAME: Carl Teplitz

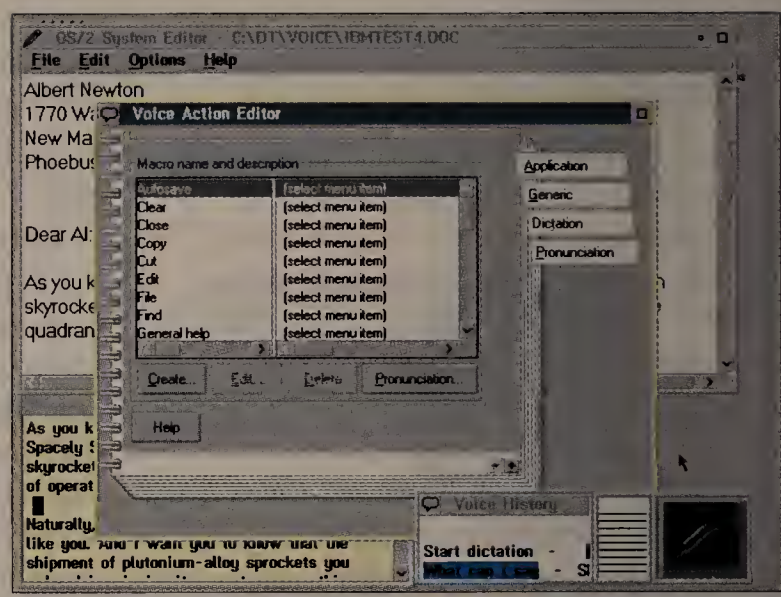
OCCUPATION: Chair and professor, Department of Diagnostic Pathology and Laboratory Medicine, Beth Israel Medical Center, Manhattan Campus for the Albert Einstein College of Medicine

WHERE: New York

VOICE RECOGNITION SYSTEM: Kurzweil Pathology Product, Kurzweil Voice Path, and Kurzweil Voice for Windows



Finally, the program features scores of prefab commands for a dozen major Windows apps, as well as a powerful macro editor for adding new commands. DragonDictate's the most complete voice recognition package around, and the only choice for those who need hands-free operation without a lot of hassle. Just be prepared to spend quality time correcting errors as it learns your voice. *Dragon Systems, 800/825-5897* **Reader service no. 789**



IBM'S VOICE ACTION EDITOR lets you add voice macros to your applications—a good thing, since VoiceType Dictation comes with few built-in commands.

IBM VoiceType Dictation for OS/2

With VoiceType Dictation for OS/2, IBM seems determined to turn your PC into a dictaphone. Like that early marvel of office automation, this $998 combination of software and sound board excels at some jobs (creating long memos, for example) and bites the dust at others (such as inserting numbers into a large spreadsheet). But even with its 32,000-word, user-customizable vocabulary, VoiceType Dictation is no replacement for a keyboard—you'll have to create voice macros to perform even simple tasks.

VoiceType got off to a rough start with its required 2-hour training exercise, followed by several hours of processing. VoiceType then took over most of my 15-inch screen with windows displaying a microphone on-off button, a volume meter, a voice history box containing the last words spoken, and the dictation window, where I wound up doing most of my work.

Unlike Kurzweil Voice and DragonDictate, VoiceType makes you input text into a dictation window, which you then cut and paste into your apps. This scheme has one huge advantage: You can dictate several pages of text before you need to make corrections, so you don't have to derail your

ADVENTURES WITH THE SINGING COMPUTER

structions, which told me to pause between each word, I said, "Fold—paper—in—half—lengthwise—period." The Singing Computer typed, "Full old pepper." I said, "Whoops!" It typed, "Moon." Losing it completely, I giggled, and it transcribed, "Moon lookup benefit the media at a hit inning."

After the tutorial, I started "training" the machine by speaking to it. You might say I found this a difficult honeymoon—say, like that of two virgins from different planets and anatomically different species. Since I couldn't think of anything to say to this strange creature, I read aloud from its docs.

As I spoke, Kurzweil Voice showed what it thought I was saying and gave several choices in the correction box. If its hearing was only slightly off (for example, I said "tomato" and it heard "potato"), I'd find the right word listed as an alternative. If it was wildly off (I said "tomato" and it heard "pummel"), my word wasn't listed and I had to type it in. And if the machine proved to have consistent problems recognizing a word (that is, it always confused "tomato" and "pummel"), I yelled for the Recognition Wizard to come help me. With the Wizard called up, I typed the problem word and then intoned it three times while clicking the heels of my ruby slippers. Afterwards, the Singing Computer was supposed to know that word.

All this dictating (and correcting) made me hoarse, frankly. I think I'd prefer carpal tunnel syndrome or even housemaid's elbow. While the Singing Computer's vocabulary slowly progressed, mine regressed—to that of a nasty fifth-grader. Happily, though, all the dirty words (which I arrayed in complete sentences insulting Kurzweil Voice) are in the built-in vocabulary. It's not that Kurzweil Voice is hypersensitive—rather, it's grossly insensitive until it's learned your speech pattern. It seemed to "hear" me best when I really popped my consonants, like you learn never to do when you talk on the radio.

Once I had read 800 words or so to it, the machine invited me to engage in its official training regimen: I *continued on page 154*

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train of thought to fix mistakes. Simply say "start dictation" and begin talking. As you speak, VoiceType inserts each word into the dictation window and records your voice on disk (soaking up about half a megabyte of disk space per minute). When you're finished, you say "stop dictation" and begin correcting mistakes.

To fix errors, you select an incorrect word with the mouse (or with voice commands). VoiceType plays back the recording of your voice, letting you compare what you said with what the program thought it heard. It then displays a list of alternative choices for the word. But if the word that you want isn't listed there, you have to type it in—VoiceType doesn't accept voice input to spell out corrections. Once you've made all of your corrections, you can transfer the text to your application.

When I first dictated my business letter, VoiceType missed about one out of five words, putting it on a par with Kurzweil Voice. But it proved to be a fast learner—after a few more runs through the letter, I was able to dictate it virtually error-free. VoiceType also proved less sensitive to background noises than DragonDictate or Kurzweil Voice.

However, the cut-and-paste scheme backfires with spreadsheets. You must either transfer data cell by cell from the dictation window—a bit like trying to fill a bathtub with an eyedropper—or create macros to move the cursor from one cell to another. To enter data using macros, you must dictate the macro names along with the data—and even then you can paste only one row or column at a time. The process was so onerous that I could not complete a simple, spreadsheet-based expense report.

VoiceType provides minimal tools for navigating the OS/2 desktop, and supports only a handful of applications via basic menu commands. (IBM says the Windows version offers broader application support.) To use this system hands-free, you'll need to create voice macros for virtually every key—<Tab>, <Delete>, and all the alphanumeric ones—and use them to make corrections and fill in dialog boxes.

If you're using OS/2, VoiceType Dictation is the only game in town. And it is certainly the most natural system for dictating and editing text in long documents. But its limited navigation and mouse support puts it well behind the DragonDictate package,

RULES OF SPEECH

While speech recognition products are impressive, they have distinct limitations. So before you get on speaking terms with your PC, it helps to know the ground rules, which apply regardless of the program you use.

Rule 1: Lower your expectations. These packages can't handle conversational speech—at least not yet. For the software to recognize individual words, you must talk like Robbie the Robot, pausing...briefly...between ...each...word.

Rule 2: Practice, practice, practice. Whether you talk like a Brooklyn cabdriver or a Texas oil tycoon, speech recognition programs will adapt eventually to the sound of your voice. But they'll make a lot of mistakes along the way, especially at first. The key to ensuring accuracy is to correct errors whenever they occur; be sure to set aside extra time for fixing mistakes.

Rule 3: Go back to basics. Using a speech recognition program means learning a new way to work. You'll need to run each program's automated tutorial and spend quality time with the manual before you're ready to talk turkey.

Rule 4: Get ready for some manual labor. All three programs require you to install a sound card, which means you may have to futz with jumpers and DIP switches to get the board's settings just right.

Rule 5: Talk ain't cheap. Leave room in your budget for some hefty hardware. All three programs require a 486 or Pentium PC with plenty of RAM—8MB or more dedicated solely to the speech software, plus additional RAM to run your other applications.

ADVENTURES WITH THE SINGING COMPUTER

was to read aloud a list of 400 words (it takes about 15 minutes) and then let it spend a couple of hours digesting my sounds, during which I couldn't use the computer. The vocabulary list gives an important clue to Kurzweil Voice's target market: Among the words are "abnormal," "attenuation," "bone," "benign," "blood," "bowel," "bilateral," "cast," "cardiac," "chronic," "compression," and "cyst" (just in A to C). Obviously, if you're a doctor updating online medical records in the middle of the night, the Singing Computer knows your vocabulary. If you're in some other field, you're going to have to rap it on the knuckles to get it to learn your own profession's lingo.

Although I was starting to grow accustomed to dictating to a computer, the quality of the prose that came out of the process was equivocal, to say the least. It was nothing at all like chatting with the ship's computer on *Star Trek, the Next Generation*. In earth year 1995, you have to pause after each word. If I spoke normally, even at slow speed, the computer responded with either "word not recognized" or some bizarre attempt to turn my phrase into a multisyllabic word. (It seemed to favor "intifada.") Kurzweil Voice's manuals say that a mere 1/16 of a second is enough of a pause, but at this early stage (about 12 hours' use over three sessions), the program seemed to need a good ½ second between words.

A more serious obstacle is that as it types, the computer can remember only four words at a time, and its typing speed is by no means rapid (at least compared to my fast-flitting fingers flying over the keys at 120 words per minute). If I outran its transcription speed, it typed the beginning of my sentence, skipped the middle, and cut to the last word. A reasonably quick "First—you—fold—the—paper—in—half" produces "First you fold half" (or more likely, "Thirst do polled calf"). Trying to speak slowly enough made me forget what I was saying. When I spoke pokily, word by word, I forgot the end of my intended *continued on page 158*

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PROFILES IN VOICE RECOGNITION

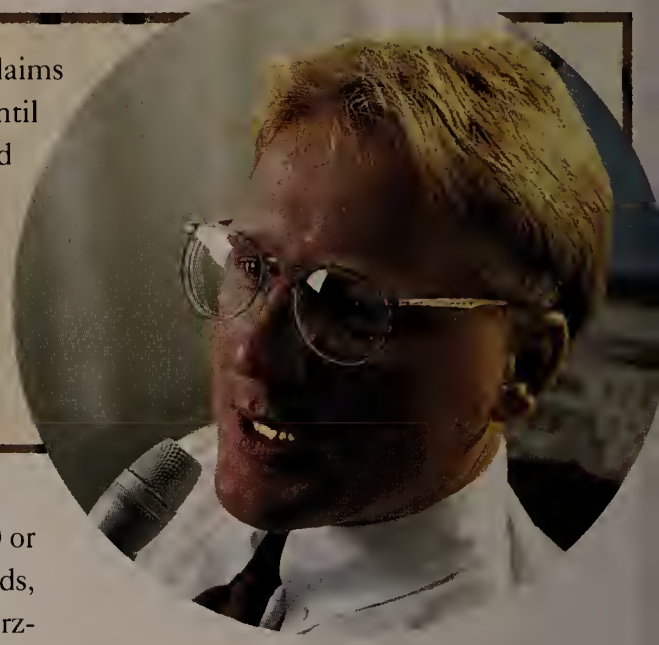
NAME: Darcy Readman

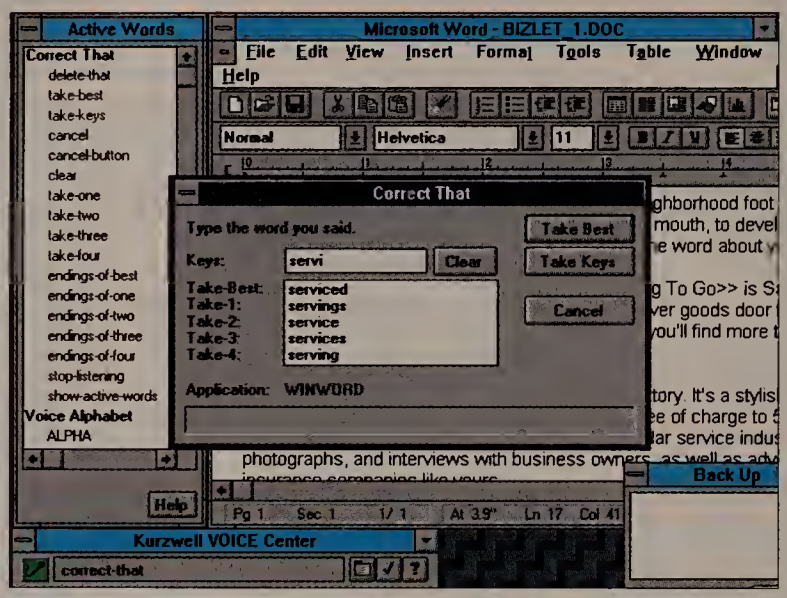
OCCUPATION: Bankruptcy lawyer, Duncan & Craig Law Firm

WHERE: Edmonton, Alberta, Canada

VOICE RECOGNITION SYSTEM: Kolvox Communications' Law Talk, based on DragonDictate

"Lawyers have a keyboard phobia," claims bankruptcy lawyer Darcy Readman. He should know. Until Readman discovered DragonDictate in 1991, he shunned computers. These days, Readman has become such a voice recognition software enthusiast that ten partners in his firm have followed suit. "We were burning cash in Dictaphone costs," he says. "Nearly half our secretaries' time was taken up transcribing. [Voice recognition] frees them up to do more productive work."





WHEN KURZWEIL VOICE FLUBS a word, you can fix it by choosing from a list of alternatives or by spelling the proper word in the Correct That window.

and spreadsheet jocks will want to steer clear—it's simply not up to the task. *IBM, 800/825-5263*

Kurzweil Voice 1.0 for Windows

Kurzweil Voice for Windows is a mixed bag of strengths and flaws. The $995 package includes a DSP-based sound board and lets you install a base list of 20,000 or 40,000 words, depending on your system's memory, with room for 10,000 or 20,000 of your own words, respectively. While Kurzweil Voice isn't designed for totally hands-free operation, it may be the best compromise between accuracy and ease of use.

Like DragonDictate, it lets you bypass the training step and begin dictating immediately. As with its competitor, you get better results if you train it first—an easy exercise consisting of 400 words. The program took 90 minutes to process this on my DX2-66 system.

But Kurzweil Voice looks more like IBM VoiceType, with separate windows for the microphone status, the voice history, and a list of alternative words. As with the other packages, you use discrete speech (with pauses) to enter data and text.

To issue commands, you use continuous speech—specific word combinations such as "file-save"—so that the program can distinguish commands from dictated text.

This method's less confusing than switching between separate command and dictation modes, but it forces you to memorize Kurzweil Voice's less-than-intuitive command syntax. For example, the program understands "file-save" but not "save-file."

Otherwise, dictating in Kurzweil Voice is just like using DragonDictate: I had to interrupt my train of thought after every three or four words and repair the sentence, since the program can only correct the last ten words spoken. Beyond that, you'll need to edit text with a word processor—Kurzweil Voice won't learn from the correction.

Fortunately, Kurzweil Voice does a good job of learning from its mistakes. Like VoiceType, Kurzweil Voice missed one word or punctuation mark out of every five in my business letter, but it improved the most with repeated exposure. On my third attempt, Kurzweil Voice cut dictation time nearly in half. I enjoyed similar gains in speed and accuracy when filling out the expense report in Microsoft Excel. However,

ADVENTURES WITH THE SINGING COMPUTER

sentence. If I said the whole sentence, speaking more rapidly, by the time I finished entering the numerous corrections, I had forgotten the rest of my thought.

I found I got the best results by speaking in the staccato monotone of a Conehead: "We—are—from—France—period." Unfortunately, this also triggered stilted Conehead prose. Assuming that I had no objection to putting my name on half-baked, inarticulate, vapid, scattered, and rather stupid-sounding verbiage, I might have been able to manage writing a simple memo with Kurzweil Voice in my old role as a middle manager. On the other hand, any half-competent steno can do it better and faster. On the third hand, if you're looking for a way to update a patient's medical chart when there's no secretary in sight, well, it's probably easier to read than a doctor's handwriting.

My honeymoon with the Singing Computer was over; I demanded an annulment. I wrote the first two paragraphs of this story in blue ballpoint pen on a lined yellow legal-size pad. Then I hit my own computer to type what I'd written and compose the rest.

Kurzweil Voice was never going to sing "Mack the Knife" to me, after all. In farewell, I sang to the Singing Computer, and here's what it heard (in parentheses):

Oh, the shark has pretty teeth, dear,
(Of, the shot has prey keep, deer,)
And it keeps them pearly white.
(And it keeps them curly whites.)
Just a jackknife has Macheath, dear,
(Just a check knife as accede dare,)
And he keeps it out of sight.
(And he keeps it out of sight.)

—Naomi Wise

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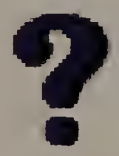

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FEATURES COMPARISON

Voice Recognition Has Rough Edges

● Yes
○ No

	DragonDictate 1.0 for Windows	IBM VoiceType Dictation for OS/2	Kurzweil Voice 1.0 for Windows
Key features			
List price	$995 [1]	$998	$995
Maximum active vocabulary (number of words)	30,000	32,000	30,000 [2]
Custom vocabularies available	○	●	○
System requirements			
Minimum RAM (MB)	7	8	8 [3]
Minimum disk space (MB)	17	62 [4]	30
Minimum processor	486DX-33 [5]	486SX-25	486DX-33
Full-length ISA slot required for board	○	○	●
Features			
User-customizable vocabulary	●	●	●
Voice macros	●	●	●
Estimated training time (minutes)	15 to 30	90 to 120	15 to 30
Dictate text directly into applications	●	○	●
Adjustable dictation speed	●	○	○
Adjustable cursor movement speed	●	○	○
Voice control capabilities			
Turn microphone on	●	○	●
Create file names	●	○ [6]	●
Move, copy, and delete files	●	○ [6]	●
Control pointer	●	○	○
Drag objects with pointer	●	○	○
Issue commands at system prompt	●	●	●
Scroll list of voice commands	●	○ [6]	○
Correct errors	●	○ [6]	●
Service and support			
Warranty (days)	90	90	90
Money-back guarantee (days)	○	30	30
Toll-free technical support	○	●	●
Weekday technical support (hours)	8	12	10
Weekend support	○	○	○
Fax support	●	○	○
BBS	●	○	○

[1] Classic Edition; includes optional DSP sound card.
[2] 60,000-word version also available at same price.
[3] 60,000-word configuration requires 16MB of RAM.
[4] 32MB of disk space needed after training is complete.
[5] If DSP card option is not used, faster processor recommended.
[6] Requires macro.

er, the program never rivaled my speed on the keyboard—it took about twice as long for me to dictate these documents as it would have taken to type them.

Kurzweil Voice's major weakness is its limited set of navigation tools. You can move the cursor in any direction up to a distance of five words, lines, or cells, and you can tab your way around the desktop and dialog boxes. But like VoiceType, it lacks mouse controls. You'll soon find yourself reaching for the nearest rodent.

Despite its flaws, Kurzweil Voice is more accurate than DragonDictate, and it's a friendlier spreadsheet cell-mate than IBM VoiceType. If you're willing to mix mouse, keyboard, and voice, Kurzweil Voice may be the best option. *Kurzweil Applied Intelligence, 800/380-1234* **Reader service no. 790**

Freedom of Speech?

To paraphrase an old joke, using speech recognition software is like watching a dog walk on its hind legs—it's not always graceful, but it's amazing the thing can do it at all. And depending on how you use them, voice input products can be worth the money, time, and effort.

IBM VoiceType Dictation is best suited to executives and other professionals who are used to dictating their thoughts but want to eliminate the costs and the time delays of using transcription services. However, its usefulness doesn't extend to other key business applications, such as spreadsheets and databases.

For people who are disabled or simply can't use a keyboard on the job, DragonDictate is best for hands-free operation; Kurzweil Voice and IBM VoiceType Dictation require a lot of customizing before they'll work without mouse or keyboard. If you're feeling hand pain and want to reduce or even eliminate keyboard work, Kurzweil Voice offers the best combination of accuracy and ease of use across all applications.

Despite voice input's tremendous appeal, average business users will want to hang on to their keyboards and mice a little longer—they're still easier, faster, and cheaper. But this technology holds enormous potential. As speech recognition improves, it will eventually eliminate the need for typing skill and will flatten the software learning curve. Freed of keyboards, computers will become even smaller and more portable (imagine the two-way wristwatch PC). In fact, everything from a personal organizer to your telephone will one day respond to the sound of your voice.

Now that will really be something worth talking about.

For more information about all products in this article, circle reader service no. 913.

Contributing Editor Daniel Tynan has been talking to his computer for years. Naomi Wise is a San Francisco–based freelance writer. Leslie Crawford contributed the profiles that appear in this article.

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intel inside

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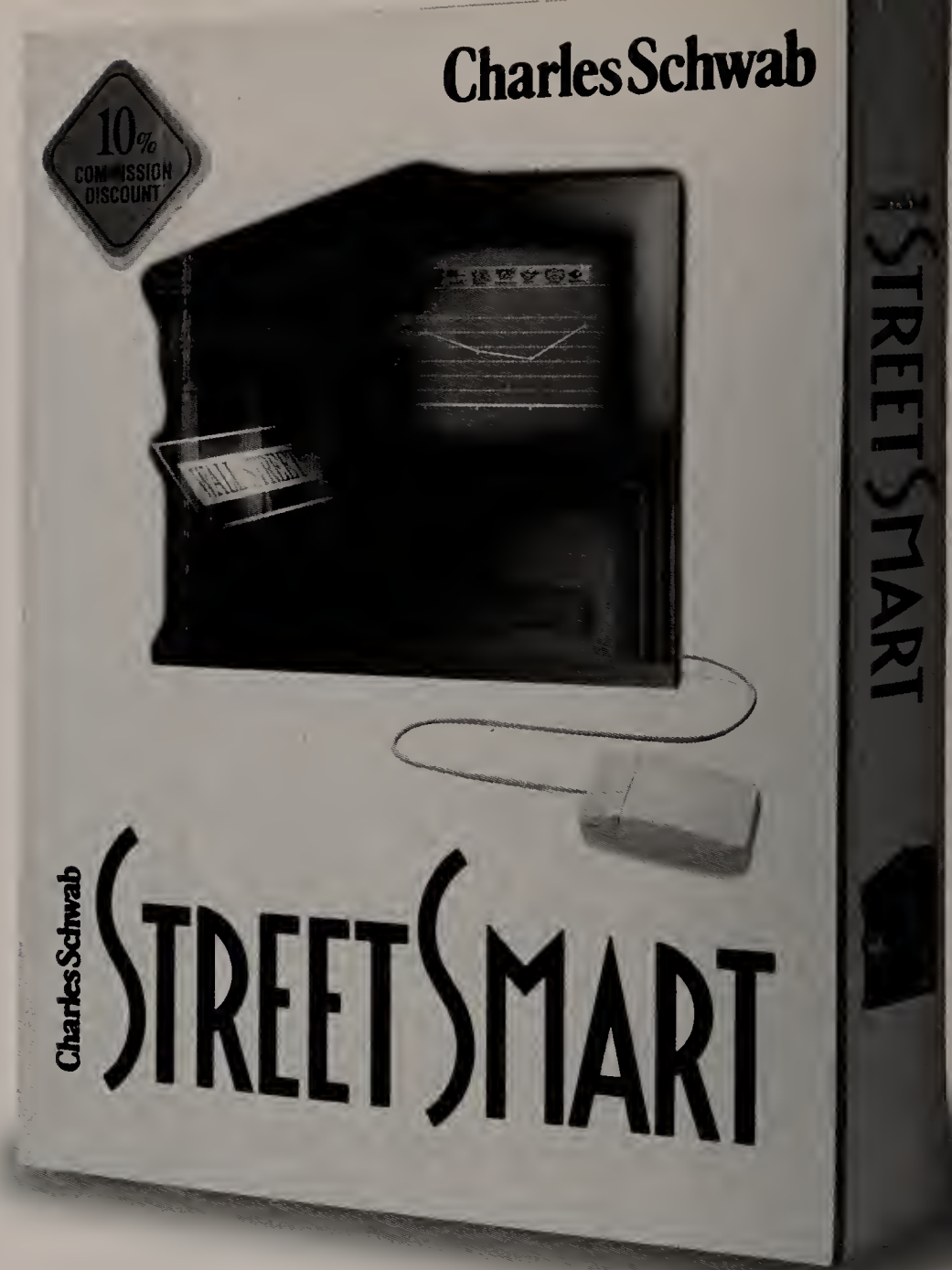

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Trying to sock away money for the future, control those "miscellaneous" expenditures, pay your bills on time? Start with one of these top personal finance packages.

Easy Money

Personal Finance Software

BY PETER SCISCO

You get $100 from the automatic teller on Monday, and spend it all by Wednesday. If money flows from your pocket as easily as a raft gliding downstream, it's time to take the helm and steer clear of the financial rapids. And personal finance packages are the safest harbor you can find. But these programs' narrow focus on check writing and bill paying has come at the expense of complete personal financial management and planning. The latest Windows money managers have much more to offer. They help you create a budget based on past expenditures, evaluate your progress toward financial goals with charts and graphs, devise a prudent debt management plan, track investments, and generate tax forms. Several also offer financial advice and create what-if scenarios to explore various financial possibilities.

All these neat innovations, however, don't change the bottom-line requirement that deters most people from using them: You have to enter all your financial data by hand. Wouldn't it be great if some "agent" entered all that information in the middle of the night while you slept? You can stop dreaming, because new-generation finance packages aim to allow modem access to information already available in electronic form, such as checking and savings account balances, credit card statements, and stock quotes.

At press time, only stock quotes could be downloaded into all the packages we looked at. But a few programs also offer links to banks, electronic check-paying services, and more.

The Choice Is Yours

We reviewed five Windows-based money managers—Kiplinger's Simply Money 2.0, Managing Your Money 2.0, Microsoft Money 3.0, MoneyCounts 8.0, and Quicken Deluxe 4.0. Microsoft and Intuit, which make Money 3.0 and Quicken Deluxe 4.0 respectively, announced plans to merge Intuit into Microsoft. Pending regulatory approval, the merger is expected to be completed in early 1995. At the same time that it swallows Intuit, Microsoft will sell Money to Novell, Inc. (For more on the merger, see *Top of the News*.)

Since even the most expensive package—Quicken Deluxe—sells for just $60, price will be the least of your concerns. So we focused our evaluation on ease of use, features, and technical support.

The winners were clear. Both Managing Your Money and Quicken Deluxe earn Best Buys for making organizing your finances an efficient and worthwhile experience. Their interfaces are easy to use, and both packages have a wealth of valuable features. In addition, Managing Your Money stands out for its excellent financial advice, whereas Quicken Deluxe excels in its ability to automate more tasks than any other program—a real time-saver.

Automation is a key benefit of any finance package. For example, the first time you record a charitable donation, you type in complete information. For subsequent payments, just enter the first few letters of the charity's name, and your package recalls and fills in information from the last check. Adjust the amount if needed, and you've saved yourself a number of keystrokes. You can also automatically schedule payment—and reminders—for checks you write regularly.

Since even the most expensive package—Quicken Deluxe—sells for just $60, price will be the least of your concerns.

Ease of use, or lack thereof, is the first hurdle every user faces. If the package's interface doesn't make it clear how to enter your financial data, you'll probably never start using it—or stick with it. (See "Confessions of a Quickenhead.") We evaluated usability by entering more than a year's worth of financial data into each program. We set up bank accounts, transferred money, tracked investments, calculated savings plans, created loan tables, and developed what-if scenarios. And we discovered that some packages are much easier to use than others.

Check It Out

Writing checks and balancing your checkbook are these products' core tasks. Managing Your Money, Money, MoneyCounts, and Quicken Deluxe all use a checkbook metaphor; Simply Money uses an innovative button-based interface in which you drag icons to fill in checks. To print checks directly from your finance package takes special checks for your printer. A batch of 250 checks costs between about $45 and $60—much more than the $15 or so most banks charge. One third-party vendor, Designer Checks (800/239-4087), sells 250 checks that work with Quicken Deluxe, Simply Money, and Money for just $24.95.

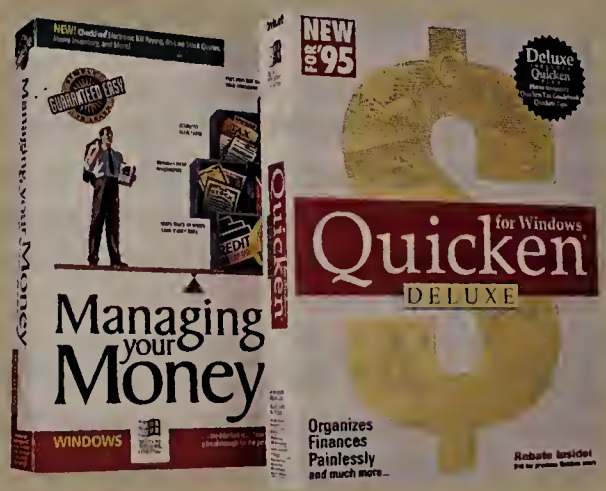
Sounds Like a Plan

Sound financial planning includes day-to-day money management as well as long-term goal planning. For the short term you need to create a budget. All the programs give you categories to get you started and can automatically create a budget based on past spending habits. By using your budget to compare actual versus expected expenses, you'll soon get a picture of where your money is going and how you need to economize to achieve long-term goals. All the programs let you create reports based on your budget and with different views of your financial information.

These packages offer many other financial planning tools as well. Special calculators make it easy to determine the effects of compound interest and inflation rates on loans and savings plans, such as mortgage payments, retirement planning, and tuition. Money's Wizards give you step-by-step instructions on how to assess various financial possibilities. Quicken Deluxe's forecasting feature analyzes your past spending and saving habits and forecasts how much money you'll have in the years to come. All the packages have portfolio management capabilities to track your return on investments, and all let you print tax reports and export data in formats supported by popular tax programs. The financial advisers in Managing Your Money and Simply Money offer tips on everything from creating a budget to buying life insurance. (The CD-ROM version of Quicken Deluxe offers similar advice but was not available in time for this review.)

BEST BUYS

Quicken Deluxe 4.0 and Managing Your Money 2.0 each organize an impressive set of features that are both easy to find and easy to use. They cover the basics with aplomb and throw in useful extras, such as graphical financial snapshots and home inventory. Quicken Deluxe stands head and shoulders above the competition for its smart automation features, whereas Managing Your Money excels by doling out astute financial advice in a friendly manner. Managing Your Money's inviting Interface opens up the program to new users and old hands alike.



CONFESSIONS OF A QUICKENHEAD

It all started when I noticed that my significant other (let's call her Lady X) was acting a little strange. For weeks, Lady X had been gathering scraps of paper and squirreling them away in odd cubbyholes around her desk. One night I peered into her office and found her sitting at her computer, surrounded by these little squiggles of paper.

"Building a nest?" I asked.

"Entering receipts," X replied. "I'm using Quicken. It's great. Do you realize that I spend 23.4 percent of my disposable income on Thai food?"

"That's nice," I said, backing slowly out the door.

"I think everyone should use Quicken," she added. "Especially *you*."

She had a point. I'm not the most fastidious personal accountant. I haven't balanced my checkbook since 1981. My idea of fiscal planning is remembering to bring my ATM card with me when I leave the house. And yes, playing Holly Golightly with my finances has cost me. In fact, the biggest mistake I ever made was *not* filing for personal bankruptcy several years ago.

But now that I was living with a Quickenhead, I knew I was doomed. I'd seen what had happened to other couples when only one of them joined "The Q." Some headed straight for divorce court; others tipped over the living room furniture and began exchanging small-arms fire. In any case, it's annoying to live with someone who keeps better records than you do. So I figured I might as well give Quicken a shot.

Playing Quicken

Installing the software was easy. Tutorials? No problem. But when it came time to set up my accounts and start plugging in numbers, I found myself cleaning the toaster oven and alphabetizing my font library. Hours ticked by. I was in Quicken denial.

But Lady X was due home at any moment—and I'd sworn that this was the day I'd start my new, financially responsible life. So I took a deep breath, closed my eyes, and dove in. I started by entering my checking and savings balances and setting up a cash account to track my walking-around money. I told Quicken's calendar to remind me when to pay the phone, electricity, and rent bills before I got disconnected, cut off, or evicted. Then I started typing in my check stubs and ATM receipts. A mouse click here, a few keystrokes there—it was almost criminally easy. When I was through, my electronic checkbook told me I was $637.58 in the red. Then I found some deposit slips hidden under the fax machine and started breathing again.

I even created a budget—the first one of my life. True, it was largely a work of fiction (how should *I* know how much I spend on hair products each month?), but soon I would get to compare it to real-life numbers.

Converted to Quickenhood

Life as I had known it was over. I could no longer fritter away money at my leisure—now I had to organize my frittering into categories and subcategories so I'd know exactly where all my cash had gone. Every item I bought had a mental Post-it note attached to it, listing its cost and category, and from which account the payment had come.

I also became increasingly tenacious about collecting every receipt, all of which I stored in a fanny pack strapped around my waist, along with a notepad and pencil to scribble down how much money I spent on parking meters and bridge tolls. Sure, I looked like a dork—but I was a Q-head now, and nothing else mattered.

Then came the day of reckoning—my bank statement arrived in the mail. Cautiously, I opened the envelope and began reconciling the statement against my electronic records. To my amazement, all of my accounts balanced. I was so proud, I printed out the reports and pinned them to my new bulletin board ($10.79, office supplies, cash).

The budget was a different story. As I'd suspected, my projected costs had only a tenuous connection to fiscal reality. Then I arrived at an ingenious solution: I altered the budget to match what I'd spent. It worked like a charm.

When I graphed all this information in a pie chart, I discovered some pleasant surprises. For one, the slices for groceries and restaurants were nearly identical in size—I was certain I'd spent far more on the latter. Surprise number 2: My income exceeded my outgo by a comfortable margin, allowing me to sock away a nice chunk of change.

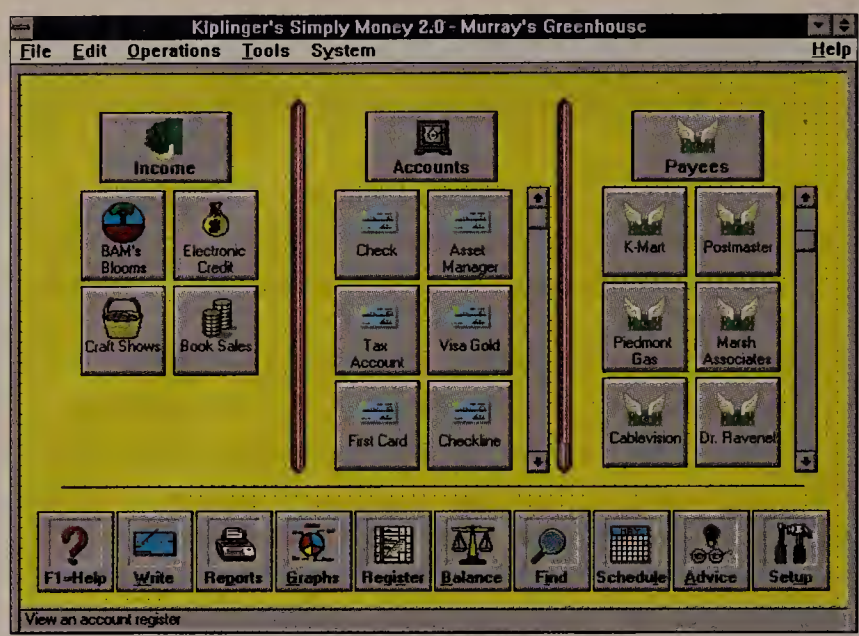
Quicken Painless?

Of course, with every major life change there's always a downside. Using Quicken has taken some of the mystery and excitement out of writing checks (I *know* they won't bounce). Having to turn on my computer and load Windows just to update my checkbook is a drag, and keeping track of every penny is a chore, not an adventure.

THANKS TO QUICKEN, contributing editor Daniel Tynan can watch how much he spends on Thai food—and pay his bills on time.

But it's a small price to pay. I no longer feel guilty when I spend money. I'm now able to do exotic things like plan my life more than two weeks ahead of time. And even if I still end up in the toilet, financially speaking, I'll know exactly why—and I'll be able to illustrate my economic demise with a series of handsome multicolor charts.

By Daniel Tynan



THE UNIQUE PUSH-BUTTON INTERFACE in Kiplinger's Simply Money may look odd, but it works well, accessing powerful financial features.

Getting the Support You Need

While all of these programs offer free telephone technical support, you have to dial a toll number to speak to a technician. Only MoneyCounts includes Saturday hours in its service. We placed two anonymous calls to each company's support lines to find out how well the company supports its users. All technicians provided knowledgeable answers to our questions, but hold times ranged from a few seconds for Money and Simply Money to a long 15 minutes for Quicken Deluxe.

The Electronic Frontier

One of the most promising developments in the personal finance software market is the emergence of electronic access to financial information. Online services currently offered include banking (Money only), credit card updates (Managing Your Money, Money, and Quicken), bill paying (Managing Your Money, Money, and Quicken), and stock quote updates (all packages). Credit card updates, bill paying, and banking services require you to establish accounts with one of a small number of organizations designated by the finance package you purchase. With Money's online banking, you can set up accounts at one of several regional banks, then get information about account status and perform basic transactions (such as transferring funds from checking to savings or learning if a check has cleared) via modem. Bear in mind that the time savings offered by going electronic are offset by a substantial cost—$3 to $10 a month, depending on what services you get and from what institution you get them.

Microsoft's pending merger with Intuit underscores the future of electronic banking. Quicken pioneered many of the links to financial institutions, and Microsoft is expected to expand Intuit's universe of electronic commerce.

Kiplinger's Simply Money 2.0

PROS: Excellent financial advice, great mortgage calculator, and quick response to support calls

CONS: Interface can be disorienting, presentation of advice can be intrusive

Simply Money turns every move you make into a drag-and-drop experience. Rather than writing a check to your mortgage company, for example, you grab a button with the company's name and drop it on the Check Account button. Those accustomed to a standard checkbook might initially balk at this approach, but it becomes second nature in no time.

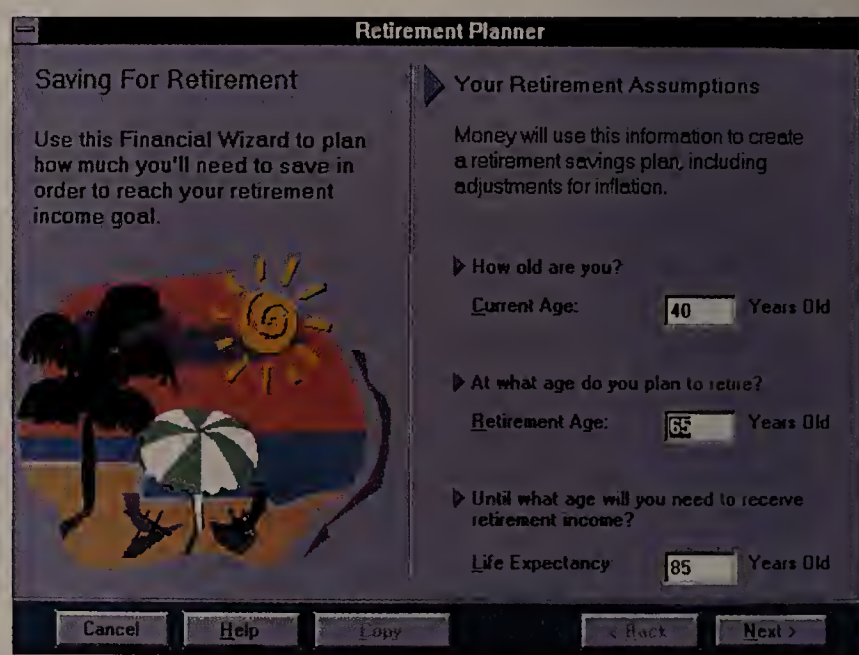
This $35 program has the most report options of any package reviewed here, reducing the need to create one from scratch. And its calculation procedure is the best, enabling you to amortize and create an account in a few simple steps.

Simply Money features financial advisers—advice from the organization that publishes *Kiplinger's* personal finance magazine, as well as newsletters, books, and videos. These advisers are triggered when you do something. For example, if you start writing a check that would overdraw an account, an icon at the bottom of the screen lights up to warn you.

If you can get a handle on Simply Money's unusual interface and if you don't mind the way it doles out financial advice, you'll find that the program houses a strong suite of personal finance tools. And the lightning-fast technical support from its courteous and knowledgeable staff is a real plus. *Computer Associates, 800/773-5445, 516/342-2000*

Reader service no. 777

THE FRIENDLY HOME-OFFICE Interface of Managing Your Money puts new users at ease—and the program's features within easy reach.



FALL UNDER THE SPELL of Money's Financial Wizards, such as this Retirement Planner, and your money decisions become easier.

Managing Your Money 2.0

PROS: Excellent financial planning tools, clean advice, best search feature
CONS: Stingy with its graphs

Managing Your Money's comfortable demeanor begins with its on-screen home-office metaphor, which arranges all of the program's features in a virtual office. Just pull up a chair (or a mouse, actually) and click on the desired drawer when it's time to pay the bills, balance your checkbook, or ponder your financial future.

This $39.95 package's financial planning tools and advice really stand out. The 13 calculators figure everything from life insurance needs (including life expectancy) to bond yields to tuition. The loan payback planning and the investment tracking tools are the best we've seen. And you get down-to-earth financial advice from money guru Andrew Tobias.

Managing Your Money has useful extras that all packages but Quicken Deluxe lack. The home inventory feature tracks all your possessions for insurance purposes, and the snapshot feature displays your net worth at a glance. The program's search feature lets you retrieve information from an earlier check to insert into a new one. The program could use more graphs, however.

Managing Your Money's extra-cost electronic features (modem required) include stock quotes, credit card updates, and a bill-paying service that writes and sends your checks for you. Since the credit card and stock quote updates come from CompuServe, you must be a subscriber to get these features.

Managing Your Money scores high marks for thoroughness, ease of use, and sound advice. Hold times for tech support averaged 8 minutes. Read the manual while you wait—the wise financial counseling inside is worth it. *MECA Software, 800/537-9993, 203/256-5000*

Reader service no. 778

Microsoft Money 3.0

PROS: Wizards make financial calculations easy; unique electronic banking features
CONS: Weak budgeting tools

On its third try, Microsoft has built a personal finance program that can compete with the other players. But it's a little late—if Microsoft's merger with Intuit is approved, Money will be sold to Novell.

Money's Financial Wizards (automatic calculators) lead you through specific functions, such as mortgage financing, retirement planning, and establishing savings goals. The Wizards' step-by-step instructions on reaching financial goals go a long way toward making personal finance software easier to use.

Money's unique electronic banking feature could save you time otherwise spent entering information from your monthly bank statement or placing calls to your bank's customer service. You can receive account balance updates, transfer funds between accounts, and even check to see what day that big check from Aunt Millie was posted to your account—all via modem.

FEATURES COMPARISON

Finance Packages Broaden Their Realm

● Yes
○ No

	Kiplinger's Simply Money 2.0	BEST BUY Managing Your Money 2.0	Microsoft Money 3.0	MoneyCounts 8.0	BEST BUY Quicken Deluxe 4.0
General features					
Estimated street price	$35	$39.95	$24.95	$29	$60
Built-in tutorial/financial advice	●/●	●/●	●/○	○/○	●/○[1]
Built-in calendar/calculator	○/○	○/○	○/○	○/○	●/●
Checkbook management, bill paying					
Reconciles against bank statement	●	●	●	●	●
Deposits checks into multiple accounts	●	●	●	●	●
Check printing/cost of 250 checks	●/$46.95	●/$49.95	●/$54.95	●/$59.95	●/$47.95
Integrated electronic bill paying	●	●	●	○	●
Schedules regular payments	●	●	●	●	●
Reminders	●	●	●	●	●
Debt management					
Tracks credit card expenses	●	●	●	●	●
Credit card account status available via modem	○	●	●	○	●
Tracks loans	●	●	●	●	●
Loan/mortgage/tuition/retirement calculators	●/●/●/●	●/●/●/●	●/●/○/●	●/○/○/○	●/●/●/●
Budgeting, financial planning					
Predefined categories	●	●	●	●	●
Automatic budget calculations	●	●	●	●	●
Savings goals	○	●	●	○	●
Forecasting	○	○	○	●	●
Manages portfolio/measures return on investment	●/●	●/●	●/●	●/●	●/●
Reporting					
Number of reports/graphs	37/31	20/6	13/11	23/20	28/40
Customizes reports	●	●	●	●	●
Compares actual to budgeted expenses	●	●	●	●	●
Compares period to period	○	●	○	●	●
Service and support					
Toll-free technical support	○	○	○	○	○
Weekday support hours	14	9	12	14	12
Weekend support	○	○	○	●[2]	○
Fax support/BBS	●/○	●/●	○/●	●/○	●/○

[1] Financial advice is included in the CD-ROM version of Quicken Deluxe. [2] 5 hours on Saturday.

For more information about all products in this table, circle reader service no. 909.

THERE'S NOTHING FANCY about MoneyCounts—just check writing and account management wrapped up in the language of a CPA.

The drawbacks to this feature are the price—$7.95 a month—and the fact that at press time you could choose from only one of four regional banks. That's fine if you live in Connecticut, Michigan, New Jersey, New York, Oregon, Washington, or parts of Illinois, but useless for the rest of us. But you can get a credit card from three of the four banks no matter what state you live in.

This $24.95 package ($14.95 until the end of January) makes modifying your budget more difficult than it should be, as it does *not* provide a spreadsheet view of your budget in which you can experiment with amounts in cells. Microsoft's tech support is fast, accurate, and polite, though.

Money makes sense if you want to give electronic banking a whirl. But if that's not enough for your needs, check out one of our Best Buys instead. *Microsoft Corp., 800/426-9400, 206/882-8080*

Reader service no. 779

MoneyCounts 8.0

PROS: Strong tax estimator

CONS: Confusing terminology, unappealing interface, poor financial planning

MoneyCounts is a no-frills money manager fraught with confusing terminology. Phrases like *posting to an account* and *process transaction* are great if you're trying to impress a CPA, but they leave novices out in the cold. The program's organization is confusing as well. MoneyCounts uses *accounts* to mean the things you buy, while *account type* describes where the money is kept. This makes a chore of what should be the simplest of activities.

MoneyCounts lets you keep only one report or graph open at a time, making it difficult to compare results. And this $29 program lacks specific calculators for tuition, mortgages, and retirement plans. Tips and techniques that should be part of the manual are available from the company as a book for an additional $19.95. And the 10-minute waits for tech support were unsatisfactory. The program's robust tax forecaster, however, is a welcome sight in an otherwise bleak landscape.

MoneyCounts doesn't have the right stuff to manage finances completely. And the dry, technical language it uses is nothing you want to deal with when facing a stack of bills on Saturday morning. *Parsons Technology, 800/223-6925, 319/395-9626*

Reader service no. 780

Quicken Deluxe 4.0

PROS: Intuitive user interface and full automation make it easy to get quick results; instant feedback for what-if scenarios

CONS: Long hold times for tech support

Quicken has always been a leader in personal finance, and the new Deluxe version is no exception. And Quicken has always outpaced Microsoft Money—so much so that Microsoft plans to buy Intuit, maker of Quicken, in early 1995.

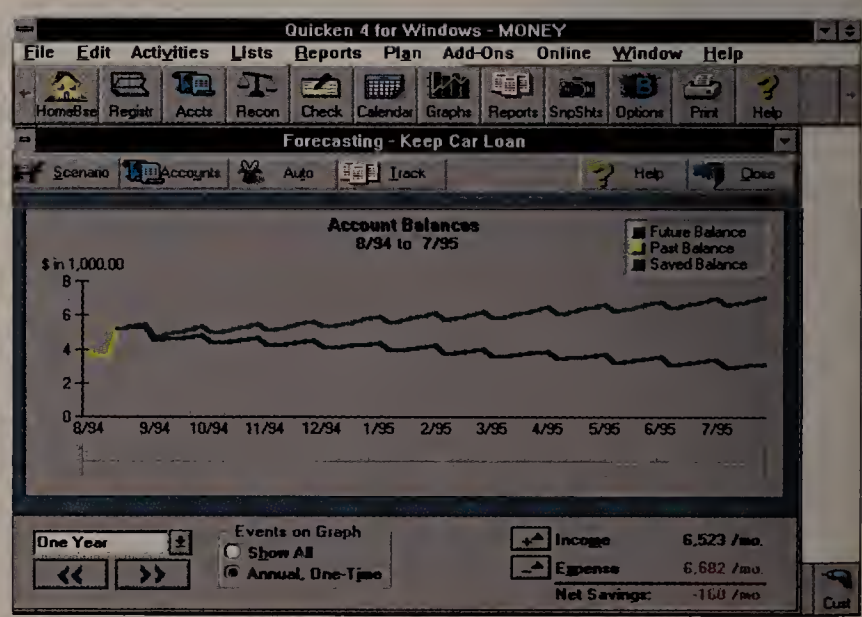
An improved interface puts any action within easy reach, from check writing to portfolio management. But this $60 program's biggest improvements are in its budgeting and forecasting tools. You can now use Supercategories to group any set of categories together (*groceries*, for example). When building your budget you can use Supercategories to exclude expenses you have no control over (such as rent or car payments), making your budgeting more realistic and much faster. The product's calculator and calendar speed data entry.

Quicken's forecasting feature lets you explore what-if scenarios. Graphs immediately illustrate what will happen to your cash flow and net worth if, for example, you accelerate the payments on your car loan. Savings Goals—phantom accounts—let you set aside money for special things like a trip abroad or a down payment on a house. And the Snapshot feature allows you to select from among five graphical views of your financial status with a simple click of a button.

Add in tax planning, a home inventory module that records valuables for insurance records, a database of historical stock values, and 101 productive tips on using the package (features not available in the regular Windows version), and you've got quite a deal. A CD-ROM version, with more historical stock data and financial advice from money gurus Marshall Loeb and Jane Bryant Quinn, should be available for the same price when you read this.

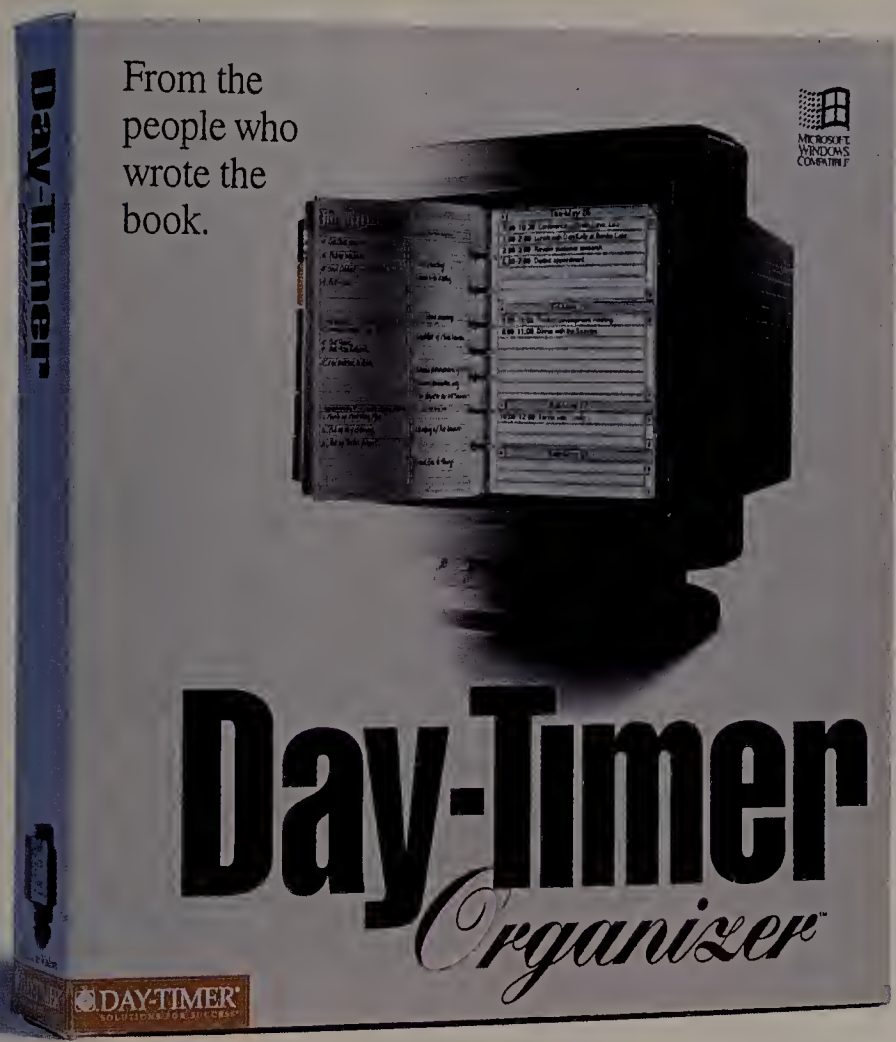
Customer service could be improved: The 15-minute hold times on Intuit's technical support line are excessive. Still, Quicken Deluxe earns a *PC World* Best Buy for its overall excellence. *Intuit, 800/624-8742, 415/322-0573*

Peter Scisco is a freelance writer who lives in Winston-Salem, North Carolina.



QUICKEN DELUXE'S FORECASTING FEATURE is just one example of how well the program automates common tasks.

Only One Company Could Fit 47 Years Of Time Management Experience On A Disk.



The people who elevated time management to an art form, announce Day-Timer Organizer™— software that integrates a calendar, address book, to-do lists, notebook and expense tracker in one easily accessible place. Start it up and you'll immediately notice a striking resemblance to your daily planner, with its clear and familiar layout. Look a little closer and discover how the power of a computer lets you instantly retrieve and sort information. Of course, there are times when you're nowhere near your desktop but still need to keep information at hand. No problem. Day-Timer Organizer lets you print lists, schedules—anything you need— in formats that fit most planners. To learn more, see your favorite software retailer, or call 1-800-859-6955 and mention key #142791. Available in Windows, DOS or Network versions.

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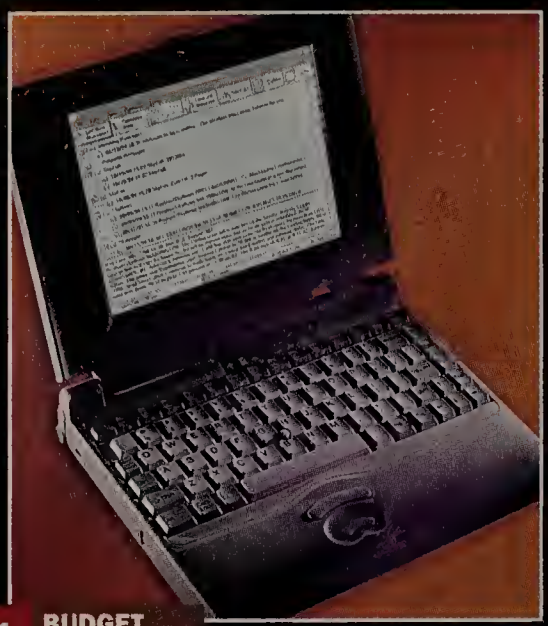

1 BUDGET MOBILE PC TOSHIBA PORTÈGÉ T3400: Nice little subnote with tremendous 6.5-hour battery life and a generous three-year warranty. Add in Toshiba's reputation for making reliable systems, and it's a steal at $1299.

1 BUDGET DESKTOP ZEOS PANTERA DX2-66: A captivating bargain for $1895. You get very fast DX2-66 performance, a 530MB hard disk, and a CD-ROM drive.

ROBERT CARDIN

1 POWER MOBILE PC COMPAQ LTE ELITE: The true no-compromise note. It's fast and comes with a 340MB hard disk, a 6.5-hour battery, a vivid screen, and great support.

1 POWER DESKTOP DELL DIMENSION XPS P90: Steady price drops keep this winner in the top spot for a record seven straight months. You get an unbelievable amount of computer for $3087–a Pentium-90 processor, 16MB of RAM, a 1080MB hard disk, a CD-ROM drive, a sound card, and speakers.

TOP 20 PCs

WELCOME TO THE 90s

With full-featured Pentium-90 PCs now priced under $2500, it's a new era of affordable high-powered computing.

Change in the PC market is like evolution in fast-forward. Personal computers based on Intel's Pentium-90 processor provide a dramatic example of this high-speed metamorphosis. Since systems based on this powerful CPU burst onto the scene six months ago, we've seen *15* Pentium-90 desktops with performance ratings over 100. PCs with this processor dominate the Power Top 20 (nearly two-thirds of this month's winners are based on the Pentium-90), but prices are dipping below the $2500 mark, and this processor is showing up on our Budget Top 20 as well.

The star of this month's new systems, Micron's P90 PCI Home MPC, is a shining example of peak power at a budget price. This Pentium-90 minitower—one of five Pentium-90 systems we've reviewed that are now selling for under $2500—grabbed the number two Power Desktops spot. It's close on the heels of Dell's Dimension XPS P90, which has held the top spot for seven months in a row. The Micron Home MPC's $2499 price also secured a high place for that system on our Budget list. The Home MPC delivers blazing

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POWER DESKTOPS PG. 176
BUDGET DESKTOPS PG.182
MOBILE PCs PG. 188

By Bryan Hastings, John Goddard, and Melissa Riofrio

Testing by Dave Casini, Ulrike Diehlmann, Susan Silvius, and Kirk Steers; research and support by Mike Salayko

speed, multimedia, a roomy 530MB hard drive, a fast fax-modem, great service, and lots and lots of software. Spend $3087 on the top-rated Dell system, and you get even more: a hot Pentium-90 with a 1GB hard disk, multimedia, a 15-inch monitor, and tons of expandability, all backed by top-notch support. This PC's price has dropped more than $900 since we reviewed it last July. Besides Micron's Home MPC, four other Pentium-90 PCs we've reviewed now fall below our $2500 budget price ceiling.

Another of Micron's offerings—the 4100PCI Magnum—was edged out of the number one Budget Desktops spot by the Zeos Pantera DX2-66. This $1895 Pantera, whose price dropped $150 from last month, gives you a huge amount of computer for the money. It outpaced some Pentium-60 systems in our tests, it's nicely loaded with a 530MB hard disk and a CD-ROM drive, and it's backed by excellent documentation and round-the-clock tech support. Ironically, these two competing companies will likely soon be one—Micron has announced plans to acquire Zeos in a stock swap.

Among mobiles, Compaq's LTE Elite has been our top power Best Buy since it was reviewed in October. The Elite has virtually everything you could possibly want in a notebook—terrific performance, reasonably low weight, a large 340MB hard disk, an active-matrix color screen that's a joy to look at, and l-o-n-g 6.5-hour battery life. Compaq cut the price of this note several months ago by more than $500 to its current $5429. In the budget mobiles section, Toshiba's peppy Portégé T3400 takes the lead for the second month running. This 486SX-33 subnote is exceptionally inexpensive at $1299, and it's backed by Toshiba's excellent support. Like its power Best Buy counterpart, the Portégé T3400 chugs along for 6.5 hours on a single battery charge.

Pentium PC: Next Ruler of the Budgets?

If you're shopping for a budget PC, chances are better than ever that you choice will be based on the Pentium-60 processor. Once thought to be a stopgap until its souped-up siblings gained a foothold, this CPU maintains a remarkably strong presence. Its endurance comes from an extraordinary decline in price. Today's average Pentium-60 system costs only $2500, less than half what it did a year ago. Small wonder that the number of Pentium-60s in the Budget Top 20 is gaining on the DX2-66s.

There's no inertia in the mobile PC market, either. Among power notebooks and subnotes, the DX4-100 has taken off as top-of-the-line CPU—five of the mobiles reviewed this month are based on that processor. The market is preparing to take on another exciting dimension, as vendors ready Pentium-75 mobiles for sale. The Toshiba T4900CT featured in last month's *Top of the News* will be among the first of the Pentium-75 portables expected from vendors this winter. Slated to reach dealer shelves by the end of November, the T4900CT redefines the performance limits of mobile PCs—this 6.9-pound portable soundly trounced the average DX4-100 system in our preliminary benchmarks.

With the infobahn getting almost as much press as O.J. Simpson, and PC-based faxing increasing in popularity, it's no surprise that fax-modems are becoming standard issue in more and more systems. Over half of the desktops and almost half the mobiles we review this month have a fax-modem. And soon you'll be hard put to buy a system without a CD-ROM drive—four out of five desktop systems this month have them.

PC Trek: The Next Generation

Intel's Pentium-90 CPU is the pinnacle of the power processors, but not for long. Expect Pentium-90 systems to gain more of a presence in the budget category as they respond to competition from PCs based on Intel's Pentium-100 CPU and the ultrafast Pentium-clone processors from NexGen, AMD, and Cyrix. After that? Later this year, Intel is planning to release 155-MHz Pentium processors, which promise to shift the PC into warp speed.

BUYING SMART: CONSUMER TIPS

Buy a SCSI caddy-type CD-ROM drive for heavy office use.
SCSI lets you add more devices, and caddy-feed mechanisms withstand heavy use better than the tray feeds in cheaper drives.

Avoid orphaned notebooks.
Most smaller vendors don't manufacture their own notebooks. If you're thinking about buying a new or used mobile computer, find out who makes your model, and get the names of alternate sources for batteries, converters, and other parts—just in case the vendor stops supporting your system.

Check money-back guarantees.
"Money-back" does not necessarily mean "no cost." Many companies impose limitations. For example, you may be on the hook for hundreds of dollars in shipping and restocking fees.

Use a credit card.
Unless you already have a credit arrangement with the vendor, use a credit card to order equipment. The credit card company can help mediate disputes between you and the vendor or give a refund if you don't receive a product you've been charged for.

Bryan Hastings is an associate editor and John Goddard and Melissa Riofrio are assistant editors for PC World. *They can be reached on PC World Online (see page 12 for contact information).* PC World *staff members Dave Casini, Mike Desmond, Anita Hamilton, Arden Hoffman, and Susan Silvius contributed to this article.*

Call 800/434-4495 and use the fax reprint numbers listed in the Top 20 tables to order fax copies of system reviews. You may order three systems' capsule reviews for $4.95; a single capsule review plus features table and test report for $4.95; an entire month's review for $9.95 (December 1993, 3012; January 3001; February 3002; March 3003; April 3004; May 3005; June 3006; July 3007; August 3008; September 3009; October 3010; November 3011; December 1994, 3913; January 1995, 3901); and a list of all systems tested by the PC World Test Center for the Top 20 reports for $4.95. Touch-tone telephone required. Payment by Visa or MasterCard.

For more information about all products in this article, circle reader service no. 902.

This Month's Contenders

Our look at this month's contenders for the Top 20 Power and Budget Desktops and the Top 20 Mobile PCs. Icons show where systems placed on the Top 20 charts.

ArmNote TS30MC

PROS: Speedy; large, color-rich screen; integrated audio
CONS: Short battery life

Problem: Color notebooks have hardly been colorful enough for presenting detailed graphics. Solution: the ArmNote TS30MC, which displays over 16 million colors at VGA resolution on its 10.3-inch dual-scan color screen, instead of the 256 colors most mobiles can manage. Other highlights of this notebook include on-board audio and uncommonly good performance for a DX2-66 system, likely due to its healthy 12MB of RAM. Add a 450MB hard drive and an easy-to-use keyboard and trackball, and you get a lot of little computer for $2749.

ArmNote TS30MC

Arm Computer's above-average warranty covers parts for one-year and labor for three years. The company also promises to repair and return your notebook after one business day, and toll-free technical support is available for 11 hours on workdays, 8 hours on Saturdays and Sundays.

If the TS30MC has any major flaws, it's the very short battery life. This 7.6-pound PC gets only 1.7 hours of computing off a charge. Still, if you don't mind toting around an extra battery pack or two, you'll find the TS30MC fast, comfortable to use, and capable of delivering your message with sound and 16 million colors. *Arm Computer, 800/765-1767, 408/428-9800* **Reader service no. 609**

ArmNote TS30ME

PROS: Searing performance, big hard drive, integrated audio, color-rich screen
CONS: Short battery life

Arm's latest mobile PC, the $4699 ArmNote TS30ME, houses a DX4-100 processor and 20MB of RAM, which helped it post some of the best test times that we've seen from a mobile. The 8-pound notebook also comes with a large 540MB hard disk, on-board audio, and a vivid 9.5-inch active-matrix color screen. This PC is a mobile presenter's dream: The VGA screen can display more than 65,000 colors at once. You also get a PCMCIA Type III slot. Support policies are standard, highlighted by a three-year labor warranty. Toll-free tech help is available seven days a week.

ArmNote TS30ME

This Arm is indeed a strong computer, but its reach isn't quite long enough to attain the Mobile PCs Top 20 chart. We found the keyboard and mouse comfortable, but some may not like the keys' short travel or the small mouse buttons. Most serious, however, is the short battery life—the TS30ME sputtered out in less than 2 hours in our tests. However, if you need great graphics on the road and don't mind toting extra batteries, give this one a look. *Arm Computer, 800/765-1767, 408/428-9800* **Reader service no. 610**

Austin Business Audio Notebook

PC WORLD TOP 20
4 POWER MOBILE PC

PROS: Excellent performance, integrated audio, 14.4-kbps fax-modem **CONS:** Heavy

The law of personal computing is simple: If you compute on the road, you have to make compromises in your PC. If that's the case, users of Austin's Business Audio Notebook should be doing hard time, because this DX4-75 totable delivers a stunning active-matrix color display, 16-bit sound, and astounding performance. Its speed is significantly faster than that of a typical DX4-75, even rivaling the performance of a DX2-66 *desktop*. The $3749 price isn't cheap, but you get a lot of mobile for the money.

The Business Audio Notebook's rap sheet is fairly standard for a power note—8MB of RAM, an active-matrix color display, and a roomy 340MB hard drive. In addition, this PC has a PCMCIA Type III slot and an integrated 14.4-kilobits-per-second (kbps) fax-modem. As its name suggests, the Business Audio Notebook features integrated 16-bit sound. Austin adds useful Windows-based sound software—including sound clips—to make this system a multimedia platform (sans CD-ROM drive). A front-and-center trackball has smooth operation and good button placement. Finally, the battery gave us a respectable 3.25 hours of computing on a single charge.

Austin

We have just one complaint: The unit's 8.6-pound traveling weight makes it one of the heavier notes on the market. However, documentation is impressive, and the support package is highlighted by nonstop toll-free technical help. The Business Audio Notebook has so much going for it that even in the increasingly tough field of power notebooks, it nabs a spot on our most-wanted list. *Austin Direct, 800/331-1501, 512/339-3500* **Reader service no. 611**

BSI GN8549D

PC WORLD TOP 20
8 BUDGET MOBILE PC

PROS: Great price for a DX4-100, integrated audio, decent battery life **CONS:** Slow for a DX4-100, subpar support

For serious on-the-road computing, the processor of choice is Intel's DX4-100. So when the BSI GN8549D came through our doors with a 100-MHz DX4 processor and a low $2705 direct price, we were intrigued. While the performance of the GN8549D falls behind most other DX4-100s and even slightly trails the typical DX4-75 mobile, its performance is still impressive by most standards. In fact, this notebook packs enough speed and features to place in the budget section of our Mobile PCs Top 20.

THE PC WORLD TOP 20

POWER DESKTOPS

1 Dell Dimension XPS P90
No. 1 for seven months straight.

➤ New this month ◀ No change from last month
▲ Up from last month ▼ Down from last month

BEST BUYS

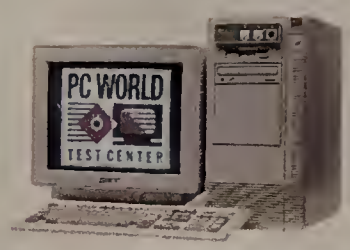
		Last month	Months on chart	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)	Bus slots
1	◀ Dell Dimension XPS P90	1	7	96	93	72/79	$3087	Pentium-90	16	1080	ISA, PCI
2	➤ Micron P90 PCI Home MPC	–	1	96	101	69/82	$2499	Pentium-90	8	530	ISA , PCI
3	◀ Austin P90	3	4	95	106	68/76	$3599	Pentium-90	16	1057	ISA, PCI
4	▲ Zeos Pantera 90	7	6	94	102	68/75	$2995	Pentium-90	16	720	ISA, PCI
5	◀ Quantex QP5/90B-2	5	3	94	96	69/78	$2828	Pentium-90	16	540	ISA, PCI
6	➤ Dell OptiPlex XMT 590	–	1	93	104	72/79	$4267	Pentium-90	16	1080	ISA, PCI
7	▼ Zeos Pantera DX4-100	2	4	93	95	68/75	$2795	DX4-100	16	720	ISA, PCI
8	▼ Micron P90PCI PowerStation	4	6	92	98	69/82	$3359	Pentium-90	32	540	ISA, PCI
9	▼ EPS P-60 Phantom	6	2	92	95	64/70	$2295	Pentium-60	16	540	ISA, PCI
10	▼ Gateway P5-60	8	4	91	80	69/72	$2449	Pentium-60	8	730	ISA, PCI
11	▼ Zeos Pantera 60	9	2	91	84	68/75	$2245	Pentium-60	8	530	ISA, PCI
12	▼ Austin P5-66	11	5	91	94	68/76	$3027	Pentium-66	16	525	ISA, PCI
13	➤ Robotech Cobra RS p90	–	1	91	107	64/67	$3581	Pentium-90	16	730	ISA, PCI
14	➤ Quantex QP5/60PM-2	–	1	91	78	69/78	$2528	Pentium-60	8	540	ISA, PCI
15	▼ EPS P-90 Explorer	14	3	90	102	64/70	$2688	Pentium-90	16	540	ISA, PCI
16	▲ Zeos Pantera 66	17	8	90	89	68/75	$2990	Pentium-66	16	720	ISA, PCI
17	▼ Quantex QP5/60W-2	12	2	90	80	69/78	$2259	Pentium-60	16	540	ISA, PCI
18	➤ Zenon Cinema A/V 90	–	1	90	107	64/67	$2899	Pentium-90	16	540	ISA, PCI
19	➤ Digital Celebris 590	–	1	90	107	76/76	$3623	Pentium-90	16	540	ISA, PCI
20	➤ Midwest Micro Elite P590	–	1	89	106	64/66	$3492	Pentium-90	16	550	ISA , PCI

[1] Call 800/434-4495 and use the fax reprint numbers listed in the table to order fax copies of system reviews. You may order three systems' capsule reviews for $4.95; a single capsule review plus features table and test report for $4.95; an entire month's review for $9.95 (June 3006, July 3007, August 3008, September 3009, October 3010, November 3011, December

2 Micron P90 PCI Home MPC
Pentium-90 at a fabulous price.

3 Austin P90
A real speedster.

4 Zeos Pantera 90
High speed and low cost.



5 Quantex QP5/90B-2
Great price on a deluxe PC.

Monitor size/ dot pitch	Vendor contact number	Issue reviewed	Fax reprint number [1]	Reader service no.	Comments
15"/.28	800/613-3355	July 94	3113	659	Seven-time no. 1 power system holds on to top spot with $150 price drop.
14"/.28	800/223-6571	current	3172	620	Fully loaded multimedia PC designed for home use makes a great office machine. Also on Budget list.
17"/.28	800/331-1501	Oct 94	3142	660	Fastest Best Buy is also priciest, but you get a big monitor and hard drive and lots of memory for the money.
15"/.28	800/554-5220	Aug 94	3123	661	Fast and nicely equipped; makes a great office desktop. A $400 price drop confers Best Buy status.
17"/.28	800/288-0566	Nov 94	3152	662	Nice 17-inch monitor rounds out speedy, well-configured PC.
15"/.28	800/613-3355	current	3173	616	High price is matched by great features, performance, and service.
15"/.28	800/554-5220	Oct 94	3140	663	One of the fastest DX4-100s, and loaded with features.
15"/.28	800/223-6571	Aug 94	3124	664	Speedy, compact system helped out by oodles of RAM.
15"/.28	800/447-0921	Dec 94	3162	665	Highest-rated Pentium-60; also on Budget list.
15"/.28	800/846-2000	Oct 94	3144	666	Large hard drive helps this system hold on to a Top 20 spot. On Budget list, too.
14"/.28	800/554-5220	Dec 94	3163	667	Least-expensive machine on Power Top 20 has a good basic configuration. Also a budget Best Buy.
15"/.28	800/331-1501	Sept 94	3132	668	Highest-rated Pentium-66 gets close to Pentium-90 performance, but at a price.
15"/.28	800/533-0633	current	3174	626	Ties for fastest on Top 20; comes with lots of graphics extras.
17"/.26	800/288-0566	current	3175	625	Nice multimedia setup, especially the 17-inch monitor, but slowest on Top 20.
14"/.28	800/447-0921	Nov 94	3153	669	Low-cost basic system with serious power.
15"/.28	800/554-5220	June 94	3091	670	Well-rounded, expandable tower system is longest-lasting on Power Top 20.
15"/.28	800/288-0566	Dec 94	3164	671	Configured with nice multimedia and home features, but a little slow. Also on Budget list.
15"/.28	800/899-6119	current	3176	627	One of the fastest we've tested, with lots of multimedia goodies.
15"/.28	800/722-9332	current	3177	614	Fast, loaded, Digital quality; hindered by high price.
17"/.26	800/728-8582	current	3178	621	Fast performer held back by fairly high price.

3913, January 1995 3901); and a list of all systems tested by the PC World Test Center for the Top 20s for $4.95. Touch-tone phone required. Payment by Visa or MasterCard.

For more information about all products in this table, circle reader service no. 903.

The GN8549D comes with 4MB of RAM expandable to 36MB, a 340MB removable hard drive, and a 9.5-inch dual-scan color display that provides sharp images. This 7.6-pound notebook also boasts integrated 16-bit audio, an internal microphone, and jacks for external speakers and microphone. The design is solid—no rickety port covers or loose screen hinges here—and components such as the removable hard drive and battery are easy to access. The notebook managed an impressive 4-hour showing in our battery tests, and we appreciate the compact battery adapter.

BSI

Sure, we have a few gripes. BSI's support policies are a little thin, with a somewhat laggardly 5-day turnaround policy on repairs, a fleeting 15-day money-back guarantee, the usual one-year warranty, and only 9 hours of weekday technical support, for which you pay the toll. We were also disappointed by the unpolished documentation. Still, the GN8549D has a nice feature set, and it's one of the fastest mobiles you can buy for a budget price. Even if you get an additional 4MB of RAM to bring the system's performance more in line with its DX4-100 kin, you'd still be paying a very reasonable price for this notebook. *Broadax Systems, 800/872-4547, 818/442-0020* **Reader service no. 612**

Commax SmartBook III

PROS: Speedy, built-in audio, large hard disk **CONS:** Short battery life, heavy

Commax's SmartBook III comes with a fast DX4-100, 16MB of RAM, and 128K of secondary cache, making it one fast notebook. It's also enjoyable to use, with large keys and an easy-access trackball. Other features include a removable 540MB hard drive and a PCMCIA slot that accommodates a Type II and a Type III card at once. Add a bright 9.4-inch active-matrix color screen and 16-bit audio, and it's not a bad deal for $4595.

Commax

Drawbacks include a meager 2 hours, 9 minutes of battery life; a heavy 8.6-pound weight; and a limited 9 hours of weekday-only tech support. There's no 30-day money-back guarantee nor any stated turnaround time for repairs. These shortcomings keep an otherwise great product off our Top 20 list. *Commax Technologies, 800/526-6629, 408/435-5000* **Reader service no. 613**

Dell Latitude 450C

PC WORLD TOP 20 8 POWER MOBILE PC

PROS: Fast for a DX2-50 notebook, high-speed fax-modem, great documentation **CONS:** So-so battery life

The Dell Latitude 450C is a winner. This sleek black notebook with a 486DX2-50 processor and 8MB of RAM outperformed its average 486DX2-50 peer, and at a comfortable 7 pounds, it's lighter than most notes. Ease of use? A small, centrally located trackball is a pleasure to operate, and the keyboard provides easy control over display brightness and contrast, system setup, the external-monitor switch, and other functions.

The Latitude 450C's wealth of features includes an easily removable 520MB hard drive, a crisp 9.5-inch dual-scan color screen, and a 14.4-kbps PCMCIA fax-modem. Even with the modem installed, one PCMCIA Type II slot remains free. The 450C clocked a respectable 3 hours, 13 minutes in our battery rundown tests, and you can replace the floppy drive with another pack to extend battery life.

Dell Latitude

Dell's attention to detail extends to service and support. The 450C's comprehensive manuals are clearly written and well organized, and Windows users can consult an online manual as well. Reaching the company is easy, thanks to an online phone directory. Dell offers a three-year warranty, and there's 24-hour telephone support every day of the year.

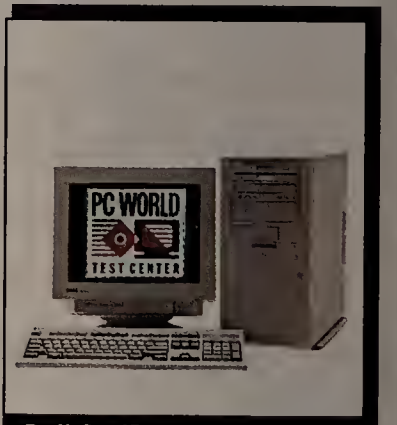
In short, Dell's latest mobile PC shows up well in all areas. Considering its unusually fast performance, wealth of desirable features, and outstanding service and support, the Dell Latitude 450C is an exceptional deal for $3349. *Dell Computer, 800/613-3355, 512/338-4400* **Reader service no. 615**

Dell OptiPlex XMT 590

PC WORLD TOP 20 6 POWER DESKTOP

PROS: Terrific performance, massive hard drive, three-year warranty **CONS:** None

You rank high in the Top 20 by being good at everything, and Dell's latest desktop, the OptiPlex XMT 590, fits that bill very nicely. For starters, it's a truly hot performer. This Pentium-90 unit with 256K of secondary cache and 16MB of RAM whirled through our tests, finishing considerably faster than the typical Pentium-90. The OptiPlex XMT 590 also comes with a very good feature set. The whopping 1GB hard drive with integrated Enhanced-IDE adapter lets you go wild with giant applications and media files, and the integrated 2MB PCI graphics adapter works together with a 15-inch monitor to deliver crisp images up to 1024 by 768 resolution. You also get a CD-ROM drive, and Windows for Workgroups comes preinstalled.



Dell OptiPlex

This minitower has good expandability, too. One of the two available PCI slots shares a port opening with one of the five free ISA slots; all the slots accept full-length cards. The combination floppy drive frees up an externally accessible drive bay for a total of three free bays, including one internal. Although you can't upgrade the secondary cache, you do get two free SIMM sockets. Finally, Dell offers an impressive support package for its high-end

OptiPlex line. You get 24-hour tech support and a three-year warranty with a year of free on-site service. Dell receives high marks from readers responding to our Reliability and Service Monitor. Our one gripe—Dell's seven-day repair turnaround policy is longer than most.

If you demand top performance and lots of data storage space, the OptiPlex just might be your next PC. Although $4267 is not cheap, it's money well spent on this impressive package. All factors considered, it's easy to see why the OptiPlex XMT 590 very nearly achieved a Best Buy in this month's roundup. *Dell Computer, 800/613-3355, 512/338-4400* **Reader service no. 616**

Digital Celebris 590

PC WORLD TOP 20
19 POWER DESKTOP

PROS: Superfast, great service and support
CONS: Limited expandability

If it's raw power you're looking for, take a gander at Digital Equipment's Celebris 590. Stoked with 16MB of RAM and 256K of secondary cache, this PCI-based Pentium-90 compact trounced the average Pentium-90 in most of our tests. It's one of the fastest PCs we've had on the bench. You also get a roomy 540MB hard drive and a 15-inch monitor with a fast PCI graphics controller. The 64-bit integrated graphics controller comes with 1MB of DRAM.

Digital

The Celebris is backed by Digital's excellent service and support, which has some of the strongest policies you can find. You get a long three-year warranty, free on-site service for the first year, a two-day turnaround policy on factory repairs, and around-the-clock toll-free technical support.

We can't rave about every aspect of the Celebris 590. For one thing, its expandability is limited. Only three slots are free, including one that accepts either a PCI or an ISA card. Also, you get only one free drive bay, and all four SIMM sockets are filled. If you want more than 16MB of RAM, you must pull at least one SIMM. Another concern is price. While a couple of months ago $3623 was great for a fast 90-MHz Pentium PC, some really fast, well-stocked Pentium-90s—including some with multimedia—have appeared for a few hundred dollars less. Still, this system is enough of a deal to capture a place on our Power Desktop Top 20, and Digital devotees with the need for speed should definitely check it out. *Digital Equipment Corp., 800/722-9332* **Reader service no. 614**

Ergo PowerBrick 100

PROS: Very fast, four-year warranty, high-speed fax-modem
CONS: Short battery life, heavy

The Ergo PowerBrick 100 isn't cheap, but for $4795 you get a lot of computer. This DX4-100 unit with 16MB of RAM not only is one of the fastest notes we've seen, it comes packed with goodies. You get a 9.4-inch active-matrix color screen, a 530MB hard drive, a 14.4-kbps fax-modem, and a software bundle that includes Verbex speech recognition, the AskSam information manager, and the ExpensePro report manager. You can add still more devices, too: The PCMCIA slot takes two Type II cards or one Type III card.

The keys have good travel and a light click and are arranged in a near-standard layout. The trackball and its buttons are located on the notebook's front panel, a design we found comfortable.

Ergo

Overall, the PowerBrick 100 did very well in our evaluation, and it's backed by a whopping four-year warranty. Several factors, however, keep it from highest honors. At a hefty 8.6 pounds, the PowerBrick 100 lives up to its name. Also, its battery pooped out in less than 2.5 hours in our tests. Finally, the money-back guarantee lasts only 15 days, and tech support is available only during business hours. Still, the PowerBrick 100 warrants serious consideration if you're looking for top-notch performance and great graphics and don't mind carrying an extra battery pack. *Ergo Computing, 800/633-1925, 508/535-7510* **Reader service no. 617**

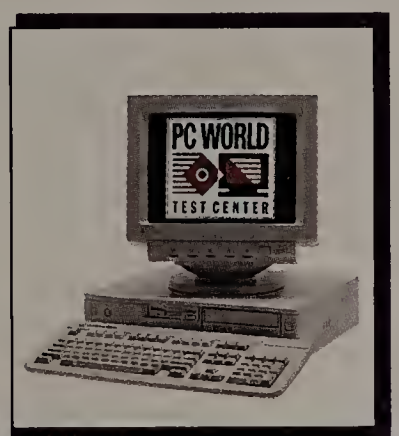
Gateway 2000 Family PC 4DX2-66

PC WORLD TOP 20
11 BUDGET DESKTOP

PROS: Large hard drive, high-speed fax-modem
CONS: Limited expandability

Looking for a system that can serve you well at home and at the office and doesn't cost a bundle? Gateway's latest may be just what you need. The company offers a solid all-around value with its Family PC 4DX2-66. For only $1899, you get strong performance, multimedia, and a good software bundle.

The Family PC 4DX2-66 comes with a basic load of silicon—8MB of RAM and 128K of secondary cache. So we were pleasantly surprised when it noticeably outperformed the typical system of its class. The PC also comes with a very large 730MB Enhanced-IDE hard drive. And Gateway includes a lot of extras. Along with the CD-ROM drive, Altec Lansing speakers, and sound board, you get CommWorks communications software, a 14.4-kbps fax-modem, and seven CD-ROM titles. Gateway also has very good support policies. Although we would like to see a guaranteed turnaround time on factory repairs, the three-year warranty, free on-site service for the first year, and 18 hours of free weekday phone support plus Saturday hours are uniformly excellent.



Gateway

We do have a few beefs. Expandability is about what you'd expect from a loaded compact—limited. You get only three free slots, including two PCI, and only one drive bay is available. There is plenty of room, however, to add RAM, with two of the three SIMM sockets free. Also, we would have liked a larger monitor with this system than the 14-inch model supplied. The monitor is driven by a 1MB PCI graphics controller. But overall this a great PC for families and those with moderate office-computing

What other companies consider optional, we consider standard

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560M-540 $1999

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THE PC WORLD TOP 20

BUDGET DESKTOPS

1 Zeos Pantera DX2-66
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➤ New this month ◀ No change from last month
▲ Up from last month ▼ Down from last month

BEST BUYS

		Last month	Months on chart	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)	Bus slots
1	▲ Zeos Pantera DX2-66	2	2	91	70	68/75	$1895	486DX2-66	8	530	ISA, PCI
2	▼ Micron 4100PCI Magnum	1	4	89	80	69/82	$2099	DX4-100	8	420	ISA, VLB
3	▲ ATronics PCI/66 Emerald	27	5	89	59	64/67	$1450	486DX2-66	8	256	ISA, PCI
4	▲ Intelesys P5-60	6	2	89	74	64/70	$1850	Pentium-60	8	430	ISA, PCI
5	▼ Zeos Pantera 60	3	2	89	84	68/75	$2245	Pentium-60	8	530	ISA, PCI
6	➤ Micron P90 PCI Home MPC	–	1	89	101	69/82	$2499	Pentium-90	8	530	ISA , PCI
7	◀ Vtech Platinum 486DX2/66 Dual	7	2	89	63	69/62	$1859	486DX2-66	16	500	ISA, VLB
8	◀ Quantex QP5/60W-2	8	2	89	80	69/78	$2259	Pentium-60	16	540	ISA, PCI
9	▼ VTech Expo 486DX2-66	4	2	88	59	69/62	$1499	486DX2-66	8	540	ISA, VLB
10	▲ Gateway P4D-66	11	8	88	60	69/72	$2079	486DX2-66	8	730	ISA, PCI
11	➤ Gateway 2000 Family PC 4DX2-66	–	1	88	56	69/72	$1899	486DX2-66	8	730	ISA, PCI
12	▲ AST Premmia MX 4/100t	24	2	88	70	74/72	$1998	DX4-100	8	270	ISA, PCI
13	➤ Micro Express MicroFlex-VL/P60	–	1	88	77	66/66	$1899	Pentium-60	8	340	ISA, VLB
14	▼ EPS P-60 Phantom	5	2	87	95	64/70	$2295	Pentium-60	16	540	ISA, PCI
15	▲ Acma P60	43	1	87	83	73/69	$2082	Pentium-60	8	420	ISA, PCI
16	◀ CompuAdd C466D	16	9	87	56	70/72	$1899	486DX2-66	8	425	ISA, VLB
17	▼ Diamond DT 486-66	9	5	87	64	65/66	$1650	486DX2-66	8	270	ISA, VLB
18	▼ MIS M466T	10	8	87	59	78/84	$1780	486DX2-66	8	240	ISA, VLB
19	▼ Gateway P5-60	12	4	87	80	69/72	$2449	Pentium-60	8	730	ISA, PCI
20	▼ Micro Express MicroFlex VL/660	15	3	87	62	66/66	$1699	486DX2-66	8	540	ISA, VLB

[1] Call 800/434-4495 and use the fax reprint numbers listed in the table to order fax copies of system reviews. You may order three systems' capsule reviews for $4.95; a single capsule review plus features table and test report for $4.95; an entire month's review for $9.95 (December 1993 3012, May 3005, June 3006, July 3007, August 3008, September 3009, October 3010,

2 **Micron 4100PCI Magnum**
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Quick and priced low.

Monitor size/ dot pitch	Vendor contact number	Issue reviewed	Fax reprint number [1]	Reader service no.	Comments
14"/.28	800/554-5220	Dec 94	3167	672	Price drop nudges robust system into first place.
14"/.28	800/438-3343	Aug 94	3125	673	Fast, well configured, and a good all-around value from service leader.
14"/.28	800/488-7776	July 94	3179	674	Huge $550 price cut shoots basic system onto Best Buy list. Cheapest on Top 20.
14"/.28	800/577-2486	Dec 94	3169	675	Low-cost PC from little-known vendor has good feature set; price drop promotes it to Best Buy ranks.
14"/.28	800/554-5220	Dec 94	3163	667	Good all-around system also makes Power Top 20. Fastest budget Best Buy.
14"/.28	800/223-6571	current	3172	620	Loaded multimedia machine is also a power Best Buy. First Pentium-90 to make our Budget list.
15"/.28	800/815-0070	June 94	3102	676	Can accept a second processor to give a boost to multiprocessing systems like Windows NT.
15"/.28	800/288-0566	Dec 94	3164	671	Good, fast home PC that would do well in the office, too. Loaded with RAM. Also on Power list.
15"/.28	800/815-0070	Dec 94	3168	677	Ultra-cheap system does well as a basic business PC.
15"/.28	800/846-2000	June 94	3096	678	Huge hard drive for a standard desktop.
14"/.39	800/846-2000	current	3180	618	Home version of Gateway directly above. Poorer monitor and slower speed, but you get sound and pay less.
15"/.28	800/876-4278	Oct 94	3181	679	Big price cut boosts system onto Top 20.
15"/.28	800/989-9900	current	3182	619	Low-cost system is a good basic buy.
15"/.28	800/447-0921	Dec 94	3162	665	Fast, with plenty of RAM. Big price cuts elsewhere demote it from Best Buy status.
15"/.28	800/786-6888	Nov 94	3183	680	Cheap but ordinary.
15"/.28	800/627-1961	May 94	3103	681	Long-lasting winner has good basic configuration but is one of the slowest on Top 20.
14"/.28	800/989-7253	Sept 94	3138	682	Straightforward system remains a decent value. Hard drive could be larger.
14"/.28	800/733-9188	Dec 93	3052	683	Cheap PC needs a larger hard drive.
15"/.28	800/846-2000	Oct 94	3144	666	Solid desktop value. Also on Power list.
15"/.28	800/989-9900	Nov 94	3155	684	Well-configured system holds on to Top 20 slot.

November 3011, December 1994 3913, January 1995 3901); and a list of all systems tested by the PC World Test Center for the Top 20s for $4.95. Touch-tone phone required. Payment by Visa or MasterCard.

For more information about all products in this table, circle reader service no. 904.

needs. It's not the most expandable PC you can buy, but it's fast for a DX2-66, and it's got multimedia, solid backing, and a great $1899 price—a formidable combination that propels the Family PC 4DX2-66 into our Budget Desktops Top 20. *Gateway 2000, 800/846-2000, 605/232-2000* **Reader service no. 618**

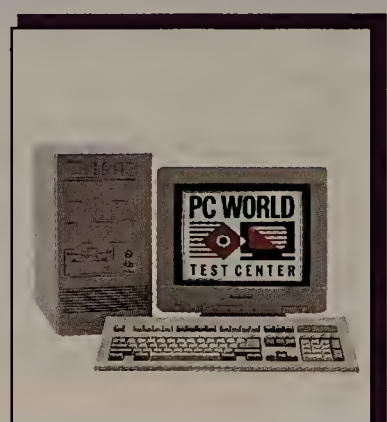
Micro Express MicroFlex-VL/P60

PC WORLD TOP 20 13 BUDGET DESKTOP

PROS: Great price, above-average Pentium-60 performance
CONS: None

Pentium-60 prices are becoming enticingly low, but it is still rare to see a Pentium-60 machine for less than $2000, and rarer still to find one at that price level that delivers superior performance for its class. The Micro Express MicroFlex-VL/P60 fits this bill beautifully, scoring a solid position on our Budget Desktops Top 20 list.

We expected that we would find compromises in this $1899 system, but the MicroFlex-VL/P60 is surprisingly well-rounded. The machine's 340MB hard disk is not enormous, but it's big enough for most users. Ditto for the 15-inch monitor, which is well supported by a 1MB VL bus graphics card. And the MicroFlex-VL/P60 performs noticeably better than the average system of its CPU class. A number of its features may contribute to this achievement, including the PC's ample 512K of secondary cache, the fast VRAM that's used in the graphics controller, and the Enhanced-IDE hard disk controller with 1MB of dedicated disk cache.



Micro Express

The MicroFlex-VL/P60 also provides respectable expandability. You get five free slots, including one for VL bus cards, and four free drive bays. And in case 8MB of RAM isn't enough, two SIMM sockets are available.

Micro Express support policies are adequate or better. While the 30-day money back guarantee, 2-day turnaround on factory repairs, and $50 on-site service for the first year (provided through GE) are run-of-the-mill, the two-year warranty is longer than most. Toll-free phone support is available only 9 hours on weekdays, but you can leave messages and get callbacks at other times.

In short, The MicroFlex-VL/P60 is an exceptionally powerful system for the money, has good expandability, and is backed by decent support. It earns a solid Budget Desktops Top 20 rating. *Micro Express, 800/989-9900, 714/852-1400* **Reader service no. 619**

Micron P90 PCI Home MPC

PC WORLD TOP 20 2 POWER DESKTOP
6 BUDGET DESKTOP

PROS: Very fast, very inexpensive, loaded
CONS: None

It's finally arrived—the full-featured budget Pentium-90 PC. Idaho-based Micron ushers in this era with its P90 PCI Home MPC. With the introduction of its fast new minitower computer, the company comes close to attaining an unprecedented Best Buy in both power and budget categories.

Let's see what your $2499 buys. First, you get a PC with surprising authority, even for a Pentium-90. Despite having the usual 256K of secondary cache and only 8MB of RAM rather than the 16MB common to most Pentium-90 desktops, the P90 PCI Home MPC tore through our test suite well ahead of its average peer. This scorching performance is even more surprising when you consider that the Micron Home MPC is loaded with multimedia devices, some of them with memory-sapping drivers: a CD-ROM drive, a sound card, speakers, and a joystick. High-end components abound, from the roomy 530MB Enhanced-IDE hard drive to the ultrafast 2MB 64-bit PCI graphics controller. Our only disappointment with the system was the small 14-inch monitor.

Micron

You get a healthy dollop of programs to go with all this hardware. Titles include Microsoft Works, Encarta, and Quicken as well as several game CD-ROMs. Micron preinstalls Phoenix Home Office, a friendly alternative to the Windows desktop. Home Office displays an 3-D image of—you guessed it—a typical home office, including a desk arrayed with the usual desktop tools. You click on the calculator sitting on the desk, for example, to start a spreadsheet, or on the pad of paper to start the word processor.

There's more good news. Despite all the peripherals, this minitower has five free expansion slots (two of them PCI), two free drive bays, and plenty of room to upgrade RAM. (Micron also offers the same system in a desktop case, with one less bay, for the same price.) Finally, Micron's respectable support includes a year of free on-site service and Saturday tech support hours, and the company fared very well in our most recent Reliability and Service Monitor. You have instant access to Micron's fax-back and BBS assistance via the ready-to-run 14.4-kbps fax-modem with software that rounds out the system.

The upshot? The system offers an unbeatable combination of high performance and features for the price. The Micron P90 PCI Home MPC gives you so much for the dollar that it captures this month's second-place Power Desktops Top 20 spot and very nearly earns a budget Best Buy to boot. *Micron Computer, 800/223-6571, 208/465-3434* **Reader service no. 620**

Midwest Micro Elite P590

PC WORLD TOP 20 20 POWER DESKTOP

PROS: Speedy, amply configured, tape backup drive
CONS: No on-site service

If you're looking for a system loaded with power and equipment, check out this month's tower from Midwest Micro. The Elite P590 is one of the fastest computers we've tested, and this Pentium-90 powerhouse comes with virtually every device you could want in a business PC, for only $3492.

For starters, this computer has 16MB of RAM, a 550MB hard drive, and 256K of secondary cache. To that, Midwest Micro adds a rare gem: a 250MB tape drive, a smart feature that could save you hours trying to recover lost work. Other extras include a CD-ROM drive, a sound card, a pair of speakers, and a 14.4-kbps fax-

modem with a bundle of communications software. Midwest Micro tops its PC off with a winning graphics system: ATI's WinBoost 2MB Mach64 PCI graphics card and spacious 17-inch monitor. The company even includes a utility that lets you set power-down modes and switch screen resolution without rebooting Windows—handy if you frequently dart between business and graphics applications.

Midwest Micro

Even with all these devices, there's still lots of space inside this tall tower. You have six free drive bays and three free expansion slots, plus two empty SIMM sockets to add memory. Midwest Micro's support policies are decent, with just a few drawbacks. The three-year warranty is a nice bonus, but there's no factory repair turnaround guarantee and no on-site service. Midwest Micro's toll-free technical support is available 13 hours on workdays and 6 hours on Saturdays.

A stellar performer, fully loaded and reasonably priced—it's easy to see why the Elite P590 is on our Power Desktops Top 20. *Midwest Micro, 800/728-8582, 513/368-2309* **Reader service no. 621**

MPC 775

PROS: Fast for a DX4-75
CONS: Loose trackball buttons, documentation vague in places

MPC jumps into the power notebook fray with the $3599 MPC 775. You get a lot of mobile computer for the money. This 8-pound DX4-75 system speaks solid power in every respect. Equipped with 8MB of RAM, the MPC 775 slightly exceeded the average DX4-75 notebook in performance, and it comes with a 9.5-inch active-matrix color display, a 320MB hard drive, and a PCMCIA Type III slot that alternatively accepts a pair of Type II cards. Need to give on-the-road presentations? A 1MB graphics controller supports 256 colors at 1024 by 768 resolution on an external monitor. The system's nickel–metal-hydride battery provided a good 3 hours, 20 minutes of power in our endurance tests.

MPC

We have a few complaints. Although the keyboard is comfortable, the trackball buttons were a little difficult to use, not always registering a click when expected. Also, while the manual details the basics and defines terms carefully, it's less specific about how some functions work. Finally, while MPC's support policies are fairly standard—a one-year warranty, a 30-day money-back guarantee, and a 2-day turnaround policy on repairs—technical support is available only 9 hours each weekday. Fortunately, the company also has Saturday hours.

Overall, the MPC 775 notebook is a solid value, and its ranking is not far short of the Mobile PCs Top 20. *MPC Technologies, 800/672-8990, 714/724-9000* **Reader service no. 622**

Olivetti Philos 46C Plus

PROS: Speedy for a DX2-50 mobile, long battery life, integrated audio, solidly built
CONS: Trackball difficult to use

Olivetti is a big name in the typewriter business, but the Philos 46C Plus demonstrates that the company knows a thing or two about more advanced machines. This system isn't cheap at $4193, but you get a lot, including an 8.5-inch active-matrix color screen, a removable 240MB hard drive, an internal 9600-bps fax-modem, a PCMCIA Type III slot, and built-in audio. The unit even includes an ISA adapter and an external chassis for using the removable hard drive on a desktop PC. Finally, hard-core number crunchers will appreciate the convenient numeric keypad located above the keyboard. Equipped with 8MB of RAM, this 7.8-pound unit sped through our tests noticeably faster than a typical DX2-50 notebook. It also held on for more than 5 hours before the battery ran out of juice.

Olivetti

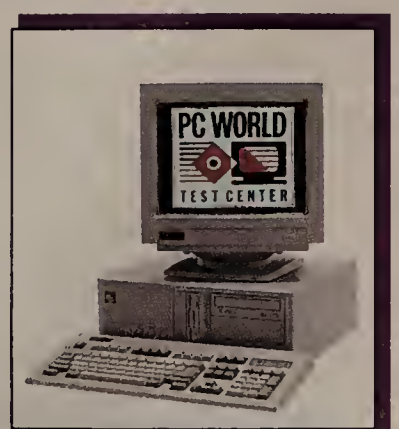
Not that the Philos is without rough edges. Clicking and holding the mouse button while using the pop-out trackball required awkward hand and finger positions, making even a short game of Solitaire a chore. And the notebook's keys were a little stiff for our tastes and lacked concavity to keep busy fingers from slipping. And while the generally solid service polices include around-the-clock tech support, that support is free only during the warranty period. Still, the Philos 46C Plus has a lot going for it, and it places not far short of our Mobile PCs Top 20 power section. *Olivetti North America, 800/633-9909, 509/927-5600* **Reader service no. 623**

Polywell Poly 560MPC

PROS: Low price, fast, voice mail **CONS:** None

Polywell's speedy new entry combines a low $2250 price with impressive Pentium-60 performance—this compact PC galloped through our benchmarks more like a Pentium-66 unit.

A 550MB hard drive, 8MB of RAM, 256K of secondary cache, and a CD-ROM drive provide the basics, but it's the extras that catch your eye. One of the coolest features can help out when you're away from your desk, answering the phone and recording voice-mail messages. The sound card includes a built-in 14.4-kbps fax-modem, so it can pick up calls and send and receive faxes. Polywell even tosses in a pair of 8-inch speakers. Our single disappointment involves the graphics team-up. While the powerful 2MB 64-bit VL bus graphics board can provide excellent graphics at super VGA, the small 14-inch monitor is most useful for VGA. For upgradability, you get two free drive bays and five free expan-



Polywell

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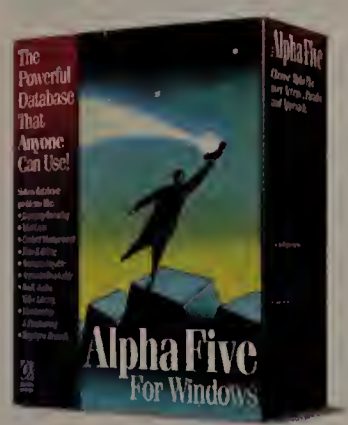

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1 Compaq LTE Elite
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➤ New this month ◄ No change from last month
▲ Up from last month ▼ Down from last month

		Last month	Months on chart	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
POWER SYSTEMS										
1	Compaq LTE Elite	1	4	107	48	83/89	$5429	DX4-75	8	340
2	Toshiba Portégé T3600CT	2	3	104	41	80/80	$4199	486DX2-50	8	250
3	TI TravelMate 4000M	3	3	102	54	69/78	$4250	DX4-75	8	340
4	Austin Business Audio Notebook	–	1	100	52	72/67	$3749	DX4-75	8	340
5	AST Ascentia 900N	4	4	100	45	66/72	$5929	DX4-75	8	510
6	WinBook XP	5	2	99	43	62/70	$3999	DX4-75	8	520
7	Austin Business Audio 4/100	6	2	99	69	62/71	$4799	DX4-100	16	500
8	Dell Latitude 450C	–	1	99	39	69/82	$3349	486DX2-50	8	520
9	Zeos Meridian 400C	–	1	99	63	63/61	$3095	DX4-100	8	350
10	Compaq LTE Elite 4/40CX Model 170	7	2	98	34	83/89	$4254	486DX2-40	8	170
BUDGET SYSTEMS										
1	Toshiba Portégé T3400	1	8	100	29	80/80	$1299	486SX-33	8	120
2	IBM ThinkPad 355	2	6	98	29	75/83	$1999	486SX-33	4	170
3	Compaq Contura Aero 4/33C Model 170	3	7	97	28	83/89	$2044	486SX-33	8	171
4	Gateway Handbook DX2-40	4	6	96	27	62/85	$1499	486DX2-40	8	130
5	CTX EzNote	5	2	96	36	62/69	$2149	486DX2-50	8	250
6	AT&T Globalyst 200 (486SX-33)	6	2	93	34	74/83	$2710	486SX-33	8	170
7	Twinhead SlimNote 550S	7	3	92	36	62/69	$2749	486DX2-50	8	340
8	BSI GN8549D	–	1	90	38	62/63	$2705	DX4-100	4	340
9	Toshiba Satellite T1960CS	8	4	90	31	80/80	$2599	486DX2-50	4	200
10	Toshiba Portégé T3400CT	9	3	90	23	80/80	$2499	486SX-33	4	120

Best Buy

[1] CA = color active, CD = color dual-scan, CP = color passive, MP = mono passive.

[2] Call 800/434-4495 and use the fax reprint numbers listed in the table to order fax copies of system reviews. You may order three systems' capsule reviews for $4.95; a single capsule review plus features table and test report for $4.95; an entire month's review

2 Toshiba Portégé T3600CT
Lightweight, with long battery life.

1 Toshiba Portégé T3400
Great deal on a solid subnote.

2 IBM ThinkPad 355
Big Blue quality at a good price.

Weight (pounds)	Battery life (hours)	Screen type/size[1]	Vendor contact number	Issue reviewed	Fax reprint number[2]	Reader service no.	Comments
7.2	6:32	CA/9.5"	800/345-1518	Oct 94	3650	643	Has it all: speed, battery life, portability, features.
6.2	6:48	CA/8.4"	800/334-3445	Nov 94	3653	644	Top-ranked subnote with great battery. Small screen delivers quality display.
7.5	3:35	CA/8.5"	800/848-3927	Nov 94	3654	645	Multimedia-ready notebook with quality sound and video playback built in.
8.6	3:16	CA/9.5"	800/331-1501	current	3667	611	Fast system with good audio and design comes with voice control software.
8.2	6:44	CA/10.4"	800/876-4278	Oct 94	3651	646	Great screen, battery life, and hard drive. Deluxe price.
7.4	4:26	CA/9.4"	800/468-2162	Dec 94	3660	647	Loaded, with fine screen, hefty hard drive, 14.4-kbps fax-modem.
8.4	3:08	CA/9.4"	800/331-1501	Dec 94	3661	648	Fastest notebook yet; a superb desktop replacement.
7	3:13	CD/9.5"	800/613-3355	current	3668	615	Good screen; can double battery life by swapping a second one for the floppy.
6	3:34	CP/7.8"	800/554-5220	current	3669	628	Zeos is back in notebooks with a bang; second-fastest we've tested.
7.2	8:26	CA/8.4"	800/345-1518	Dec 94	3662	649	Battery life sets record, but system is slow and needs bigger hard drive.
5.8	6:31	MP/8.5"	800/334-3445	June 94	3627	650	Basic mono subnote with great battery life and fantastic price.
6.6	5:40	MP/9.5"	800/426-7735	Aug 94	3645	651	Good battery life on basic mono workhorse.
5	6:18	CP/7.8"	800/345-1518	July 94	3637	652	Tiny color subnote has great battery life but no connector for external display.
5	5:06	MP/7.8"	800/846-2000	Aug 94	3646	653	Inexpensive mono subnote with small hard drive.
6.8	5:12	CD/7.8"	909/595-6146	Dec 94	3664	654	Ordinary color screen but great price on lightweight notebook.
7	4:45	CD/9.4"	800/637-2600	Dec 94	3665	655	Well-designed notebook needs bigger hard drive.
7.4	5:21	CD/9.5"	800/995-8946	Nov 94	3659	656	Full-size notebook with quality screen and good battery life.
7.6	3:55	CD/9.5"	800/872-4547	current	3670	612	Quickest budget notebook could use more RAM.
8.4	3:31	CD/9.5"	800/334-3445	Oct 94	3652	657	Business traveler's notebook has good features but needs more RAM.
6	5:30	CA/7.4"	800/334-3445	Apr 94	3606	658	Color version of the no. 1 subnote needs more RAM.

for $9.95 (April 3004, June 3006, July 3007, August 3008, October 3010, November 3011, December 3913, January 1995 3901); and a list of all systems tested by the PC World Test Center for the Top 20s for $4.95. Touch-tone phone required. Payment by Visa or MasterCard.

For more information about all products in this table, circle reader service no. 905.

sion slots. Polywell's great warranty covers parts for two years and labor for five. On-site service costs $75 per year, and toll-free tech support is available during weekday business hours and for 6 hours on Saturdays. Polywell also offers a 30-day money-back guarantee and a 3-day turnaround policy on factory repairs.

If you're looking for a multimedia system with some oomph and don't want to pay a bundle, take a look at the Poly 560MPC. *Polywell Computers, 800/999-1278, 415/583-7222* **Reader service no. 624**

Quantex QP5/60PM-2

PC WORLD TOP 20 14 POWER DESKTOP

PROS: Fast, 17-inch monitor, hefty software bundle
CONS: None

Chalk up another Top 20 system for little Quantex—this company packs enough power and features into its QP5/60PM-2 to land it a spot on our Power Desktops list.

We were impressed all around with the QP5/60PM-2. This Pentium-60 PC comes with only 8MB of RAM and 256K of secondary cache, yet it recorded better times than its typical Pentium-60 sibling, which comes with 16MB of RAM. And this $2528 computer is very nicely decked out. The roomy tower case holds a generous 540MB Enhanced-IDE hard drive, a CD-ROM drive, a sound card, and a 14.4-kbps fax-modem. Outside you'll find a luxurious 17-inch monitor and a pair of speakers. The monitor is paired with a 2MB PCI graphics controller to offer 100-Hz noninterlaced refresh rates at 800 by 600 resolution.

Quantex

Quantex includes a particularly robust software bundle. Along with fax and communications software and the typical mix of multimedia games and reference works, you get Borland Office 2.0, Quicken Financial Manager, and Ecco Personal Information Manager. Quantex even throws in Kodak Photo CD Access software.

But speed and an overflowing feature set aren't all that distinguish this PC. Expansion is generous, with eight free drive bays and five free slots, including two PCI slots. The company's generally standard support policies are highlighted by free on-site service for the first year and one-day repair turnaround.

In sum, the Quantex QP5/60PM-2 excels in nearly all areas and earns its place on our Power Desktops Top 20. Had it cost just a little less, it would have been a solid contender for the Budget Top 20 as well. *Quantex Microsystems, 800/288-0566, 908/563-4166* **Reader service no. 625**

Robotech Cobra RS p90 Graphics Workstation

PC WORLD TOP 20 13 POWER DESKTOP

PROS: Superfast Pentium-90, excellent software bundle, fast voice/fax-modem **CONS:** No on-site service

Robotech's debut entry, the Cobra RS p90 Graphics Workstation, caused quite a stir at *PC World*. This 90-MHz Pentium PC shot through our tests about as fast as any Pentium-90 we've seen. And Robotech packs a lot into the Cobra's minitower case. In addition to 16MB of RAM, 256K of secondary cache, and a sizable 730MB hard drive, you get a fast 2MB 64-bit PCI graphics accelerator and a 15-inch monitor. Multimedia hardware includes a CD-ROM drive, a sound card, speakers, and a microphone. Topping off the hardware bonanza is a 14.4-kbps voice-enabled fax-modem. Using the bundled FaxWorks With Voice program, you can use your PC as an answering machine.

Robotech

The Cobra RS p90 comes with scads of applications, including 200 shareware programs, Grolier's Multimedia Encyclopedia, and assorted preinstalled games. Digital artists will go wild with the three image editors, the morphing application, and the CD-ROM photo collection.

This minitower has good expandability, with six free drive bays and five unoccupied slots, two of which accept PCI cards. Robotech offers a two-year warranty, and tech support includes a half day on Saturday. While you won't get on-site service, Robotech claims same-day shipment of replacement PCs.

The Robotech Cobra RS p90 is an impressive system, and its $3581 price is in line with some of the fastest fully loaded Pentium-90s that have come our way. Add in the very large hard drive, the multimedia hardware, and one of the most extensive software bundles you're likely to see, and you've got a dynamite system well deserving of its Power Desktops Top 20 status. *Robotech, 800/533-0633, 801/565-0645* **Reader service no. 626**

Zenon Cinema A/V 90

PC WORLD TOP 20 18 POWER DESKTOP

PROS: Blazing speed, amply configured, good expandability
CONS: None

Mere seconds shy of a new speed record, Zenon's amply configured Cinema A/V 90 minitower claims an immediate spot on the Power Desktops Top 20. While the system's name suggests its multimedia savvy, users of Excel, Word, and WordPerfect will see benefits for business as well when they eye this Pentium-90's impressive benchmarks scores.

Zenon

The Cinema A/V 90's $2899 price buys a lot of machine, starting with 16MB of RAM, a hefty 540MB hard disk, a CD-ROM drive, and 256K of secondary cache. A PCI graphics card with 2MB of DRAM provides excellent high-resolution output to the 15-inch monitor. Other extras include a sound card and a pair of speakers. Perhaps this PC's foremost feature is its ability to run lengthy multimedia movies via the Cinema Plus V-30 MPEG playback card. You can view movies on the PC's screen at 640 by 480 resolution with 256 simultaneous colors. Though you may

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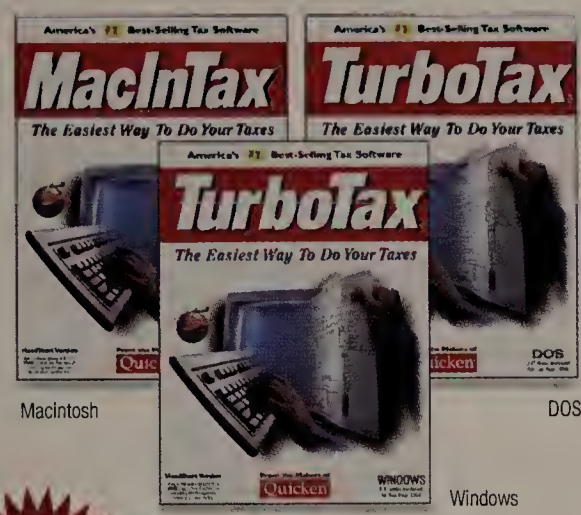

Macintosh DOS Windows

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PC WORLD

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System Snapshots

These systems present unique and valuable solutions to end-user needs, but they rate lower as business PCs than the preceding group.

AcerPower Minitower

PROS: Lots of bundled software, 14.4-kbps voice/fax-modem **CONS:** Performance below average for a Pentium-60 desktop

The $2549 AcerPower Minitower is a good all-around multimedia system. While this 60-MHz Pentium computer with 8MB of RAM and 256K of secondary cache performs a little slower than average for its CPU group, the 540MB hard drive, 15-inch monitor, and 2MB PCI graphics controller are all above par. You also get a CD-ROM drive, a sound card, speakers, a 14.4-kbps fax-modem with voice capabilities, and lots of programs, including Microsoft Works, Quicken personal financial software, and SuperVoice, which lets your PC serve as an answering machine. This minitower's three free drive bays and four unoccupied slots provide adequate expandability (one PCI slot shares a port opening with an ISA slot). The company's 24-hour toll-free technical support and free on-site service highlight otherwise ordinary support policies. While it doesn't make our Top 20 charts, the AcerPower Minitower is a good system with no major drawbacks. *Acer America, 800/368-2237, 408/432-6200* **Reader service no. 642**

Duracom EnergySaver A486/66

PROS: Inexpensive for a 66-MHz desktop
CONS: Some motherboard flex

Duracom's EnergySaver A486/66 is a no-frills desktop computer that's nicely priced at $1599. Featuring AMD's new DXL2-66 processor, the A486/66 jogged through our tests only slightly behind the average DX2-66 desktop. It comes with 8MB of RAM, a 340MB Enhanced-IDE hard drive, and a 15-inch monitor with a 1MB VL-bus graphics accelerator.

Expandability is good, with a few qualifications. Although the PC comes with three free drive bays and five free slots, none of the ISA slots accept full-length cards. Also, while the interior of the PC sports a clean and thoughtful design and has no tangled cables, the motherboard has a degree of flex that makes the board susceptible to damage if you press on it in certain places, as you might when adding graphics RAM. Duracom's support policies are essentially standard fare.

While the EnergySaver A486/66 doesn't offer enough PC to qualify for Top 20 stardom, even considering its low cost, it's a solid entry-level computer. *Duracom Computer Systems, 800/551-9000, 214/518-1200* **Reader service no. 629**

Epson ActionTower 3000

PROS: Friendly online help, multimedia components, generous software bundle **CONS:** Slow for a DX2-66

For $2298, the Epson ActionTower 3000 serves up a smorgasbord for the multimedia hungry. This minitower comes with a 486DX2-66 CPU, 8MB of RAM, a 420MB hard drive, a 15-inch monitor, and a 1MB graphics controller. Furthermore, you get a 14.4-kbps fax-modem, a CD-ROM drive, a sound card, and speakers. Four drive bays and three slots invite add-ons. Epson also supplies a generous serving of programs, and it preinstalls the FocalPoint desktop organizer to help you navigate easily between applications and access service information. Epson's service policies, however, are mostly plain vanilla, highlighted by a year of free on-site service.

While the ActionTower 3000's configuration adds bulk, the system is a little shy on muscle, ranking far below its peers in our tests. You can find similarly equipped systems with more pep on our Budget Desktops Top 20 chart. *Epson America, 800/289-3776, 310/782-0770*

Gateway 2000 Family PC 4SX-33

PROS: Very inexpensive, excellent documentation, bundled software **CONS:** Extremely slow

For only $1499, Gateway 2000 offers its Family PC 4SX-33 complete with CD-ROM drive, sound card, external speakers, joystick, 2400/9600-bps fax-modem, and big software bundle. The system is otherwise standard, with a 14-inch monitor, a 1MB video controller, and a 340MB hard disk. Even with all that, this slim desktop gives you three free slots and one free drive bay.

Support policies are good, and tech reps are available 18 hours weekdays, as well as on Saturdays. The three-year warranty includes a year of free on-site service, and the documentation is well organized and cleanly illustrated. Just don't look for speed—on our tests, this 486SX-33 PC with 4MB of RAM scored far below par for any CPU class, including its own. While the Family PC 4SX-33 is too slow to make our Top 20 charts, its many amenities make it attractive for home use. *Gateway 2000, 800/846-2065, 605/232-2000* **Reader service no. 630**

For only $1499, Gateway 2000 offers its Family PC 4SX-33 complete with CD-ROM drive, sound card, external speakers, fax-modem, and software bundle.

HiQ Neptune P90

PROS: Fast, big hard drive, good expandability
CONS: Pricey

Our test scores show that HiQ's debut entry, a fast Pentium-90 with 16MB of RAM and 256K of secondary cache, is one of the mightier machines we've tested. And although the high $3995 price does not buy you a CD-ROM drive, HiQ packs in a huge 1GB hard drive, a 14.4/19.6-kbps fax-modem, and a 17-inch monitor that's driven by a 2MB 64-bit graphics accelerator. We weren't surprised to find lots of expansion space in this tall tower: five free drive bays, four free slots (including one slot for PCI cards), and a SCSI connector. In addition, you'll find two empty SIMM sockets for memory upgrades.

Standouts among HiQ's support policies are the two-year free-labor warranty and the one-day repair turnaround. Technical support is available 12 hours each workday in addition to 5 hours on Saturdays. Had HiQ's tower of power cost less, it could have been a contender for the Top 20 charts. *HiQ Computer Systems, 800/827-5836, 408/245-5836* **Reader service no. 631**

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FEATURES COMPARISON: THIS MONTH'S CONTENDERS—MOBILE PCs

DX4-100 Mobiles Are Taking Off

● Yes
○ No
n/a = not applicable

Standard features	ArmNote TS30MC	ArmNote TS30ME	Austin Business Audio Notebook	BSI GN8549D	Commax SmartBook III	Dell Latitude 450C	Ergo PowerBrick 100	MPC 775	Olivetti Philos 46C Plus	Zeos Meridian 400C
Street price as of 10/3/94[1]	$2749	$4699	$3749	$2705	$4595	$3349	$4795	$3599	$4193	$3095
CPU	486DX2-66	DX4-100	DX4-75	DX4-100	DX4-100	486DX2-50	DX4-100	DX4-75	486DX2-50	DX4-100
Traveling weight (pounds)[2]	7.6	8	8.6	7.6	8.6	7	8.6	8	7.8	6
Width x depth x height (inches)	11 x 8.75 x 2.1	11 x 8.75 x 2.1	11.25 x 8.5 x 2	11.25 x 8.75 x 2	11.25 x 8.8 x 2.25	10.4 x 8.8 x 1.9	11.2 x 8.6 x 2.2	11.25 x 8.75 x 2.2	11 x 8.75 x 2	10.2 x 7.8 x 1.7
Installed/maximum RAM (MB)	12/20	20/20	8/32	4/36	16/36	8/20	16/32	8/40	8/32	8/20
Secondary RAM cache installed/ maximum (K)	0/0	0/0	0/0	0/0	128/128	0/0	0/0	0/0	0/0	0/0
Installed/maximum hard disk (MB)	450/810	540/810	340/520	340/520	540/540	520/520	530/720	320/540	240/240	350/350
Removable hard disk	●	●	●[3]	●	●	●	●	●	●	○
Display type	color dual-scan	color active	color active	color dual-scan	color active	color dual-scan	color active	color active	color active	color passive
Screen diagonal (inches)	10.3	9.5	9.5	9.5	9.4	9.5	9.4	9.5	8.5	7.75
Maximum colors or gray shades of LCD	16.8 million	65,500	256	256	256	256	256	256	256	256
Simultaneous LCD and external monitor	●	●	●	●	●	●	●	●	●	●
Highest resolution of external monitor	1280 x 1024	1280 x 1024	1024 x 768	1024 x 768	1024 x 768	1024 x 768	1280 x 1024	1024 x 768	800 x 600	1024 x 768
Mouse/keyboard ports	0/1[4]	0/1[4]	0/1	0/1[4]	0/1	0/1[4]	0/1[4]	0/1[5]	0/1[4]	0/1[4]
Cursor keys in inverted T	●	●	●	●	●	●	●	●	●	●
Dedicated page-control keys	●	●	●	●	●	○	●	●	●	●
All 12 function keys dedicated	●	●	○	○	●	●	○	○	○	●
Standard <Ctrl> and <Alt> layout	○	○	●	●	○	○	●	●	○	●
Built-in pointing device	●	●	●	●	●	●	●	●	●	●
Modem speed for fax/data (kbps)	n/a	n/a	14.4/14.4	n/a	n/a	14.4/14.4	14.4/14.4	n/a	9.6/9.6	n/a
Docking station available	●	●	●	●	●	○	●	●	●	○
PCMCIA slot Type II/III	0/1[6]	0/1[6]	0/1[6]	0/1	1/1	0/1[6]	0/1[6]	0/1[6]	0/1[6]	2/0
Power management										
Supports APM	●	●	○	●	●	●	●	●	●	●
Type of battery	NiMH	NiMH	NiMH	NiMH	NiMH	NiMH	NiMH	NiMH	NiCd	NiMH
Suspend button	●	●	●[7]	●	○	●	●[7]	●[8]	●	●
Suspends when case closed	●	●	○	●	○	●	●	●[8]	●	●
Service and support										
Warranty (years)	1/3[9]	1/3[9]	1	1	1	3	4	1	1	1
30-day money-back guarantee	●	●	●	○[10]	○	●	○[10]	●	●	●
On-site service first-year price	○	○	○	○	○	$199	○[11]	○	○	$50
Repair turnaround policy (days)	1	1	2	5	○	2	3	2	2	3
Daily toll-free phone support (hours)	11	11	24	9[12]	9	24	10	9	24[13]	24
Weekend support	●	●	●	○	○	●	○	●[14]	●	●
BBS	○	○	●	●	○	●	●	●	○	●
Fax	●	●	●	●	●	●	●	●	○	●

[1] All notebooks priced as configured with DOS 6.0 or later version, Windows 3.1, VGA monochrome or better display, and mouse or other pointing device. Price is direct or based on vendor estimate.

[2] Includes computer, adapter, power cord, and external floppy drive if mobile has one.

[3] Requires screwdriver.

[4] Mouse port doubles as keyboard port.

[5] Video port has separate port for mouse.

[6] Alternatively accepts two Type II devices.

[7] Suspends with key combination.

[8] Optional.

[9] One year parts, three years labor.

[10] 15-day money-back guarantee.

[11] Factory repairs first year, GE on-site service next three years.

[12] Not toll free.

[13] Free only during warranty period.

[14] Saturdays only.

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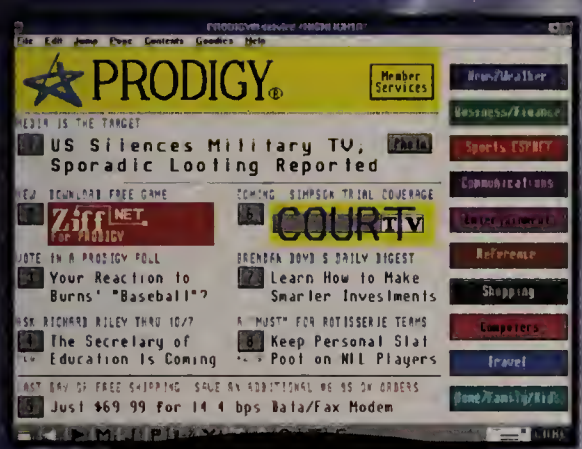

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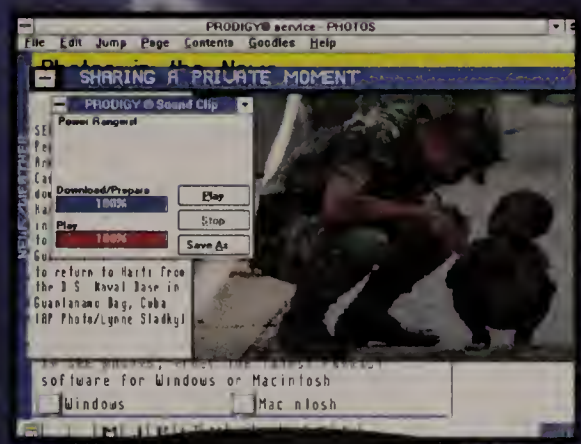

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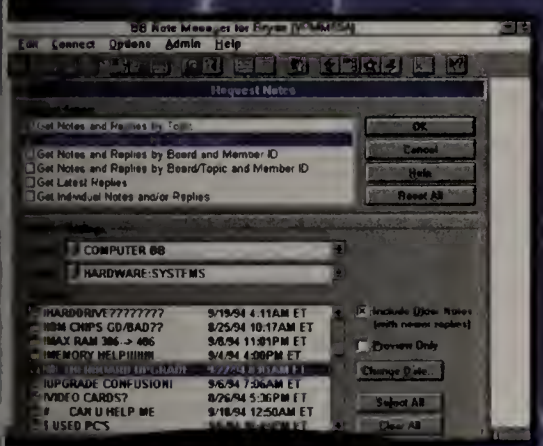

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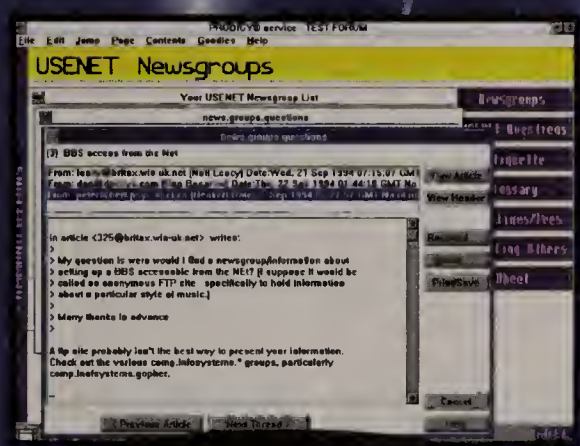

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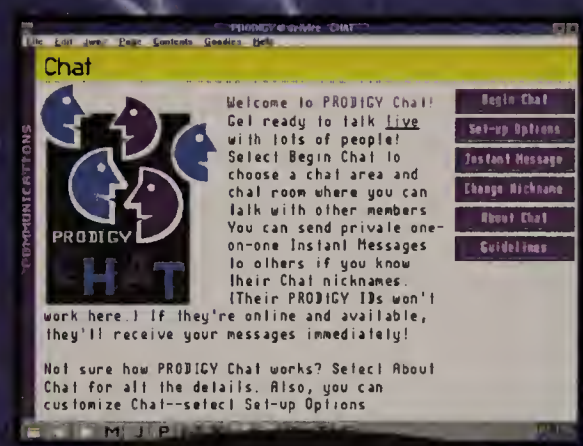

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Insight PCI P60 TW

PROS: Fast, inexpensive
CONS: Subpar Reliability and Service Monitor ratings, on-site service only in Arizona

Welcome to yet another budget-priced Pentium-60 PC—Insight's $2371 PCI P60 TW. This machine with 8MB of RAM slightly outpaced the typical Pentium-60 system in our tests. Its component set is respectable if basic, including a 420MB hard drive and a 15-inch monitor driven by a fast 2MB PCI graphics controller.

This large tower offers loads of room to upgrade—you get five free slots, including one PCI slot (which shares an opening with an ISA slot), and *11* free drive bays. Insight's support features 24-hour toll-free help, weekends included. However, on-site service is available only for Arizona residents, and Insight received less than stellar ratings in our most recent Reliability and Service Monitor. Although, the PCI P60 TW is not compelling enough for the money to place in our Top 20s, it's a decent deal all the same. *Insight Direct, 800/998-8011, 602/902-1176* **Reader service no. 632**

Insight PCI P90 Special

PROS: Fast, low price **CONS:** Below-average Reliability and Service Monitor ratings, limited on-site service

The PCI P90 Special is one of several 90-MHz Pentium PCs to break the budget barrier this month, and it had no problem keeping pace with hefty Pentium-90 competition in our performance tests. Despite an ultra-low $2371 direct price, this PC comes with a decent component set, including 8MB of RAM, 256K of secondary cache, a roomy 540MB Enhanced-IDE hard drive, and a 15-inch monitor. Unlike most Pentium-90s we've tested, however, this system lacks a CD-ROM drive and uses a 1MB PCI graphics board that's based on an older 32-bit design.

Fortunately, the PCI P90 Special offers you room to expand, with five slots and five drive bays free. Insight's basic support package is highlighted by round-the-clock tech support but hobbled by limited on-site service (Arizona residents only) and an unfavorable showing in our Reliability and Service Monitor. But overall, the PCI P90 Special is a real deal, not far short of our Top 20 list. *Insight Direct, 800/998-8011, 602/902-1176* **Reader service no. 633**

Midwest Micro Elite DX2-66 Home PC

PROS: High-speed fax-modem, lots of software, three-year warranty **CONS:** Limited expandability, some subpar service policies

For $1999, the slim Elite DX2-66 Home PC offers the works, including a 420MB hard drive, a CD-ROM drive, a sound card, and a 14.4-kbps fax-modem. The 15-inch monitor pairs with a 1MB VL bus graphics controller to give you a decent video system. Midwest Micro also provides a large software bundle. Equipped with 8MB of RAM, the Elite trailed its typical DX2-66 peer slightly in our tests. The biggest drawback to this slender PC, however, is its limited expandability: Only one drive bay and two slots are free. The company offers an uneven support package. The three-year warranty and six-day tech support are great; but there is no on-site service or stated turnaround time on factory repairs. The PC's restricted expandability and uneven service policies keep it out of the Top 20 ranks, but the Elite DX2-66 Home PC still offers a champagne configuration on a beer budget. *Midwest Micro, 800/728-8582, 513/368-2309* **Reader service no. 634**

Mitsuba Premiere System 90

PROS: Plenty of expandability, very roomy hard drive
CONS: None

Equipped with 16MB of RAM, 256K of secondary cache, and an impressive 800MB Enhanced-IDE hard drive, the Mitsuba Premiere System 90 means power. This $2975 PC also comes with a CD-ROM drive and a 1MB PCI graphics card that drives a 15-inch monitor. This tower system performed right in line with the typical Pentium-90 system and provides lots of room to grow, with five free drive bays and eight free slots, including a mix of EISA, ISA, and PCI. Mitsuba's support package includes a two-year warranty, and you get on-site service for a reasonable $39 per year. However, technical support involves a toll call and is available weekdays only, and only during the warranty period.

The Mitsuba Premiere System 90 is a highly capable machine, and it's generously configured. That it didn't make our Top 20 charts demonstrates just how fierce the competition has become. *Mitsuba, 800/648-7822, 909/392-2000* **Reader service no. 635**

Packard Bell Multimedia DX2-66

PROS: Low price, TV tuner, multimedia configuration, fax-modem **CONS:** Slow, limited upgradability

Stockbrokers, 9-year-olds, and couch potatoes, listen up: You can boot up and tune in to C-SPAN, Barney, and Oprah with the $2349 Multimedia DX2-66. This desktop's tuner card permits viewing of TV, VCR, laser disc, and camcorder images. Packard Bell rounds out its multimedia bundle with a CD-ROM drive, a sound card, speakers, a 2400/9600-bps fax-modem, and a wide choice of software titles. You also get 8MB of RAM, a roomy 420MB hard drive, and a 15-inch monitor with a 1MB VL bus graphics controller. Highlighting Packard Bell support is 24-hour tech help.

Stockbrokers, 9-year-olds, and couch potatoes, listen up: You can boot up and tune in to C-SPAN, Barney, and Oprah with Packard Bell's $2349 Multimedia DX2-66.

Liabilities are slow speed and limited expandability. This DX2-66 performed more like a typical DX2-50, and only two slots and one drive bay are free. The Multimedia DX2-66 misses our Top 20s, but if you want an inexpensive PC with TV, it's worth a look. *Packard Bell Electronics, 800/733-5858, 818/865-1555* **Reader service no. 636**

Quantex Q486SX/33VM-1

PROS: Very low cost **CONS:** Very slow

A full multimedia system with fax and data comm for only $1199? No, that's not a typo. In addition to a CD-ROM drive, a sound card, and a pair of speakers, Quantex's Q486SX/33VM-1 comes with a big software bundle and is backed by decent support.

But you don't get unqualified luxury for a pittance. Many components, such as the 14-

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Intel 486DX2-66 CPU

• 8MB RAM (Easily Upgradable to 64MB RAM) • 256K L2 Cache • 3.5" 1.44MB Floppy Drive • 420MB IDE Hard Drive w/128K Cache • Hercules Stingray VLB Graphics Accelerator Card w/1MB • Sony Int. 320ms Double-Spin CD-ROM Drive • Creative Labs Sound Blaster 16 bit Sound Card with CD Quality 20 Voice Stereo Sound and Game Port • 15" .28dp Energy Star compliant Color Monitor, up to 1280x1024*i* SVGA resolution • VLB I/O IDE • 14.4/14.4 Data/Fax Modem w/Win. & DOS S/W • Microsoft Mouse • 101 Key Keyboard • 2-Button Joystick • Stereo Headphones • Stereo Speakers • MS-DOS 6.22 • MS Window for Workgroups 3.11

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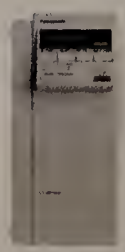

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Circle 80 on reader service card

inch monitor, 1MB VL bus graphics controller, and 2400/9600-bps fax-modem, are distinctly low-end, and the 340MB hard drive and system expandability—three free drive bays and three free slots—are basic fare. The PC's biggest drawback, however, is slow performance. This SX-33 computer, equipped with only 4MB of RAM, recorded test results much too slow for the office market. Still, it's amazing what you do get for the money—home users with a strict budget should check out this machine. *Quantex Microsystems, 800/288-0566, 908/563-4166* **Reader service no. 637**

Robotech Cobra RS DX2-66

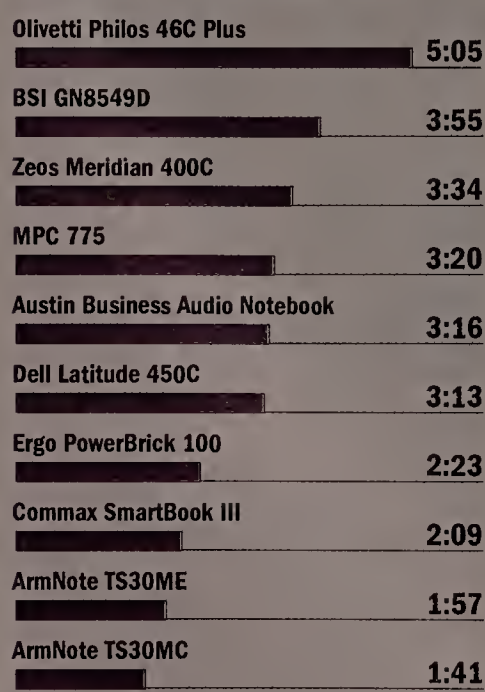
PROS: Fast for a DX2-66, plentiful software, high-speed fax-modem **CONS:** No on-site service

Robotech's Cobra RS DX2-66 jumps into the multimedia fray with a desktop that's fast and loaded and sells for only $2199. This PC comes with 16MB of RAM, which may explain its better-than-average DX2-66 performance. Even with its long list of components—a 420MB hard drive, a CD-ROM drive, a sound card, speakers, a 14.4-kbps fax-modem, and a 1MB VL bus graphics controller for the 15-inch monitor—this compact still has two free drive bays and four free slots. The system comes with a bountiful software package that includes HSC Digital Morph, Aldus Photostyler, and Altamira Composer. Support policies are decent, highlighted by a two-year warranty. While Robotech does not offer on-site service, it picks up the tab for overnight replacement of parts. You get a lot of PC for $2199, putting the Cobra RS DX2-66 not far short of our Top 20s. *Robotech, 800/533-0633, 801/565-0645* **Reader service no. 638**

A full multimedia system with fax and data comm for only $1199? No, that's not a typo! Quantex's latest comes with all that, plus a big software bundle.

BATTERY LIFE TEST REPORT

The Philos Takes You From SFO to JFK Without Refueling



Time in hours:minutes.

Methodology
We drain and fully recharge the battery and set power-saving options to match a consistent profile where possible. Office workers type at regular intervals in Word for Windows, saving periodically. Notebooks are rotated among workers to even the workloads. We report the time elapsed until the notebook shuts itself off.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

Robotech Cobra RS p60 Graphics Workstation

PROS: Nice graphics software bundle
CONS: No on-site service option

If you dabble in graphics, check out the Cobra RS p60 Graphics Workstation, a loaded Pentium-60 for only $2499. With 16MB of RAM, it turned in above-par results for its class. You get a CD-ROM drive, speakers, a microphone, a sound card, a 425MB hard drive, and a 14.4-kbps fax-modem. Along with the excellent 2MB VL bus video card and 15-inch monitor, Robotech tosses in lots of graphics software. Expandability is fair, with two free drive bays and three free slots.

The support package is highlighted by a two-year warranty. Tech reps are available every day except Sunday. The only minus here is the lack of on-site service—Robotech ships replacement parts overnight instead. While the Cobra RS p60 is not priced aggressively enough to hit the top charts, it's a fast, affordable, amply equipped Pentium-60 computer. *Robotech, 800/533-0633, 801/565-0645* **Reader service no. 639**

Wyse Forté GSV

PROS: 40-month warranty, built-in ethernet, multiprocessor capability **CONS:** Pricey

If you're looking for a server, Wyse's Forté GSV has two attractive features: ethernet connectors, and a socket for a second CPU to give you dual-processing power. You also get a hefty complement of silicon: 16MB of RAM, a 510MB hard drive, 512K of secondary cache, and a 1MB EISA graphics controller that drives a 15-inch monitor. Small wonder this Pentium-60 desktop turned in a speedy performance for its peer group. The PC also comes with a CD-ROM drive. Expandability is decent—you get five free expansion slots and two free drive bays. Wyse's solid support includes a long 40-month warranty.

The Forté GSV's high $3430 price keeps the system off our Top 20 charts, but the ethernet and multiprocessor support and Wyse's solid backing make this PC eminently suitable as the core of a small network. *Wyse Technology, 800/438-9973, 408/473-1200* **Reader service no. 640**

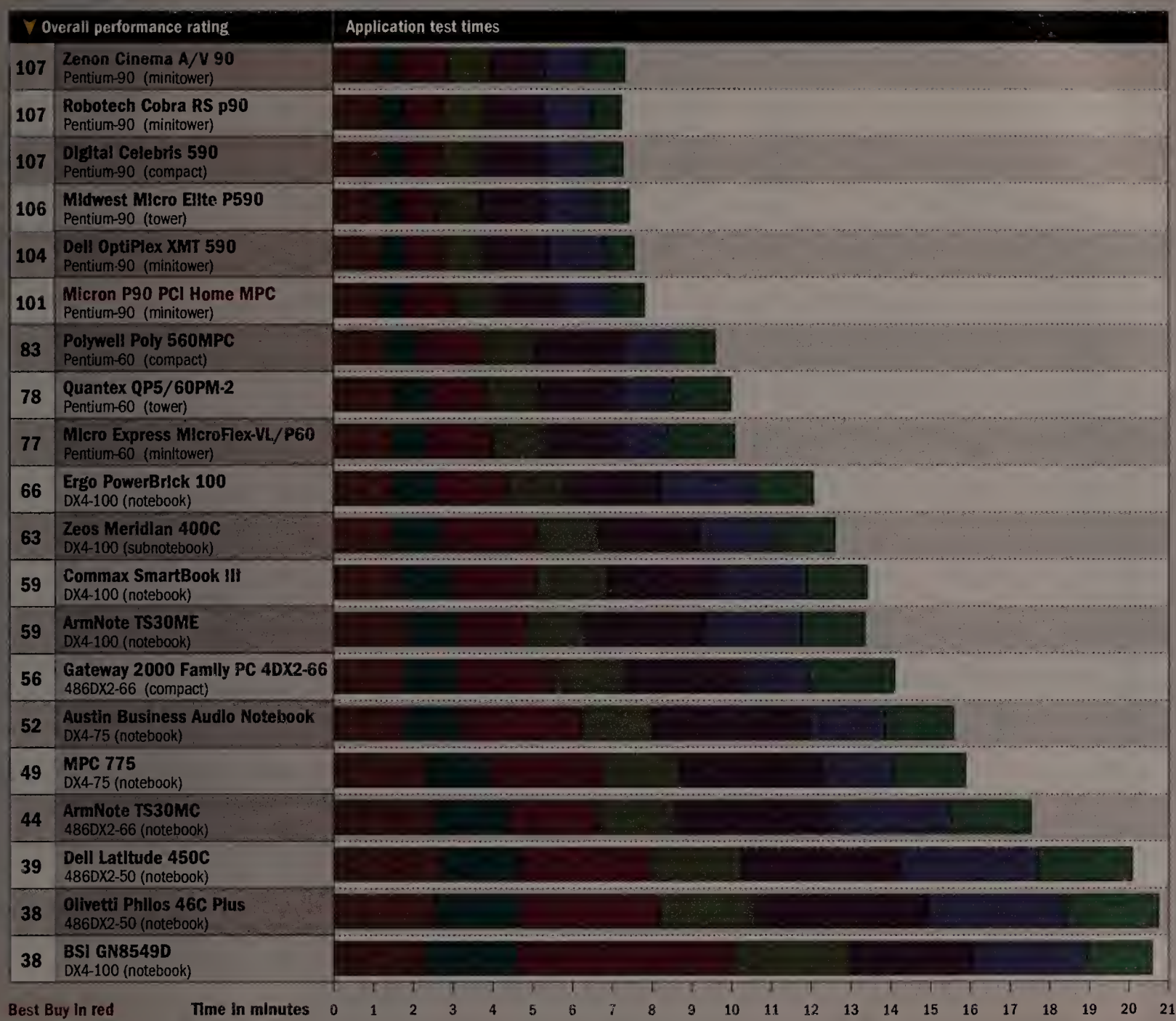
ZDS Z-Station EX

PROS: Speedy, built-in ethernet **CONS:** Expensive

The Zenith Data Systems Z-Station EX, a sleek Pentium-90 desktop, impressed us with its speed—it outpaced the typical Pentium-90—and with its feature set, which includes an ethernet adapter, 16MB of RAM, 256K of secondary cache, and a 540MB Enhanced-IDE hard drive. This system also comes with a CD-ROM drive, a 15-inch monitor, and a 2MB 64-bit graphics controller. ZDS manages to squeeze some expandability into this slim unit, providing four free slots and one free drive bay. Service and support policies are respectable, including 15 hours of tech support on weekdays. System documentation is clear, well illustrated, and well organized.

The ZDS Z-Station EX's many fine details bespeak its pedigree, but with the price hovering at $4297, you pay extra for the good name. Our Power Desktops Top 20 offers several lower-cost, decently configured systems that are as fast or faster. *Zenith Data Systems, 800/582-0524, 708/808-5000* **Reader service no. 641**

Pentium-90 PCs Dominate the Fast Lane



Systems are arranged in order of overall performance from best to worst, based on the normalized, weighted scores from seven tests. A system may have a better overall performance rating than another system that took less time to complete our test suite.

Methodology
We tested each system as supplied by the manufacturer, using the version of DOS supplied. If we installed Windows, we used the default installation. We configured Windows with an HP LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. We set video resolution to 800 by 600 pixels in 256 colors using the supplied video driver where possible. We loaded the test applications and files and test automation software and scripts.

Word 2.0 for Windows
We worked with 1-, 9-, and 28-page business documents. Operations included creating, saving, opening, scrolling, editing, checking spelling, formatting, previewing, and printing.

Excel 4.0
We opened a file and performed several data extracts, entered new data, altered calculations, formatted, scrolled, moved blocks, previewed, printed, and saved.

Paradox 1.0 for Windows
We used a custom form to add a moderate number of records to an existing table, performed several queries, and generated a report.

Freelance 1.0 for Windows
We built a six-page presentation using a standard template, clip art, text, and charts; applied several views to the presentation; and previewed and saved it.

WordPerfect 6.0 for DOS
We performed a variety of editing, formatting, previewing, and printing tasks on documents ranging from a single-page memo to a long report. Due to memory requirements, the amount of free memory for DOS in the first 640K dramatically affects this test.

1-2-3 release 3.4 for DOS
Using the graphical Wysiwyg add-in and working in three different files, we created and altered formulas, built graphs, saved, and printed.

Paradox 3.5 for DOS
We tested Paradox 3.5 running under Windows in a DOS window. We entered data, searched records, updated, and generated reports from a simple customer list.

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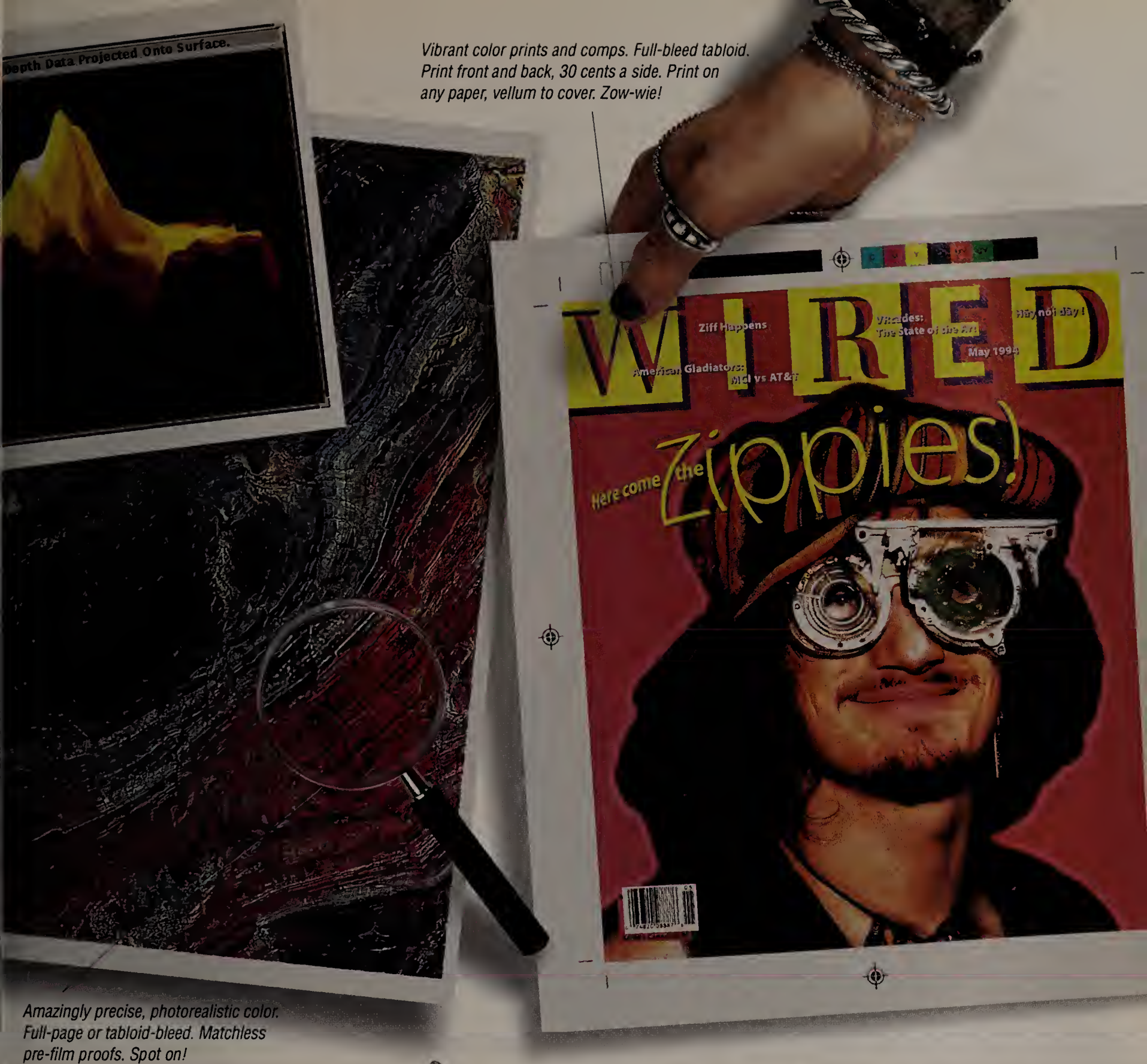

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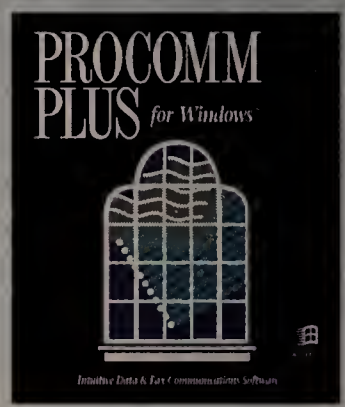

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RELIABILITY AND SERVICE MONITOR

Win a Zeos Pantera 60

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Zeos Pantera 60, a Best Buy Pentium-60 featured in this month's PC World Top 20.

HOW TO ENTER: Fax your completed questionnaire to *PC World* at 415/974-7367. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 1-SS, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by January 31.

PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact prize winners at the telephone and fax numbers they provide. If *PC World* is unable to do so within 30 days of the drawing, a substitute winner will be selected. No purchase necessary. Void where prohibited by law.

HOW TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER — —

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

○ Acer ○ Acma ○ ALR ○ Apple ○ Ares (MI) ○ AST ○ AT&T (NCR) ○ Austin ○ Blackship ○ Canon ○ Compaq ○ CompuAdd
○ Compudyne ○ Comtrade ○ Cornell ○ CTX ○ Dell ○ Diamond ○ Digital (DEC) ○ DTK ○ Eltech ○ EPS ○ Epson ○ Everex
○ Future Tech ○ Gateway 2000 ○ Hewlett-Packard ○ Hyundai ○ IBM ○ Insight ○ Intelesys ○ Leading Edge ○ Micro Express ○ Micron ○ Midwest Micro ○ MIS
○ Mitac ○ NEC ○ Netis ○ Packard Bell ○ Panasonic ○ Pionex ○ Polywell ○ Quantex ○ Samsung ○ Sharp ○ Swan ○ Tandy
○ Tangent ○ Texas Instruments ○ Toshiba ○ Tri-Star ○ Twinhead ○ USA Flex ○ VTech (Expotech, Laser) ○ Winbook ○ Zenith (ZDS) ○ Zenon ○ Zeos ○ Other

What size is this PC?
○ Desktop
○ Notebook/laptop
○ Hand-held

What is the CPU?
○ PowerPC
○ Pentium
○ 80486
○ 80386
○ Other

Where did you buy this PC?
○ Local dealer
○ Mail/phone order
○ Direct from field sales force
○ Membership discount store
○ Computer superstore
○ Home electronics store
○ Retail store
○ VAR
○ Other

After ordering, how long did it take to get your PC?
○ Less than 1 week
○ 1–2 weeks
○ 3–4 weeks
○ More than 4 weeks

Who set up your PC?
○ Dealer/retailer/VAR
○ Staff computer technician
○ Self or co-worker

WHEN YOU FIRST GOT YOUR PC

When did you buy this PC? (Specify month and year.)

○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec
○ 89 ○ 90 ○ 91 ○ 92 ○ 93 ○ 94

When you first set up your PC, were any components "dead on arrival" (DOA)?
○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)
○ Battery ○ CD-ROM ○ CPU ○ Floppy drive
○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory
○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse
○ Power supply ○ Sound board ○ Other

Did your problem occur only after adding your own hardware or software?
○ Yes ○ No ○ Don't know

Would you buy this brand of PC again?
○ Yes ○ No ○ Not sure

How many times have you had a problem with this PC?
○ No problem ever ○ One ○ Two ○ Three ○ Four ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the section at right. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Please answer for the most recent problem—*other than DOA*—not reported in a previous survey.

When did this problem occur? (Specify month and year.)

○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec
○ 89 ○ 90 ○ 91 ○ 92 ○ 93 ○ 94

How long was this after you purchased your PC?
○ Less than 1 month ○ 1–3 months ○ 4–6 months ○ 7–12 months ○ More than 12 months ○ Not sure

Did the problem occur as a result of adding new hardware or software?
○ Yes ○ No ○ Don't know

Did the problem occur under warranty?
○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)
○ Faulty component ○ Incorrectly installed software ○ Wrong configuration ○ Faulty peripheral ○ Device conflicts ○ OS problem ○ Other ○ Don't know

If a component failed, which one was it? (Mark all that apply.)
○ Battery ○ CD-ROM ○ CPU ○ Floppy drive
○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory
○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse
○ Power supply ○ Sound board ○ Other

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your PC?
○ Manufacturer
○ Dealer/store where purchased
○ Manufacturer's authorized repair technician
○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)
○ Phone ○ On site ○ In store ○ System swap ○ Component swap ○ Factory return

If you received phone service, how long were you on hold?
○ Not at all ○ Less than 1 minute ○ 1–2 minutes ○ 3–5 minutes ○ 6–10 minutes ○ 11–20 minutes ○ More than 20 minutes

How long did it take before you talked to the person who finally helped you?
○ Less than 15 minutes ○ 15 minutes–1 hour ○ 2–5 hours ○ 6–10 hours ○ 11–24 hours ○ 1½–2 days ○ 3–5 days ○ 1 week or more

How long did it take to resolve the problem completely?
○ 1–2 days ○ 3–7 days ○ 1½–4 weeks ○ More than 1 month ○ Never resolved ○ Awaiting resolution

Was the problem resolved to your satisfaction?
○ Yes ○ No

How would you rate the person(s) who helped you?

	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of PC again?
○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?
○ Not at all ○ ○ Satisfied ○ ○ Extremely satisfied

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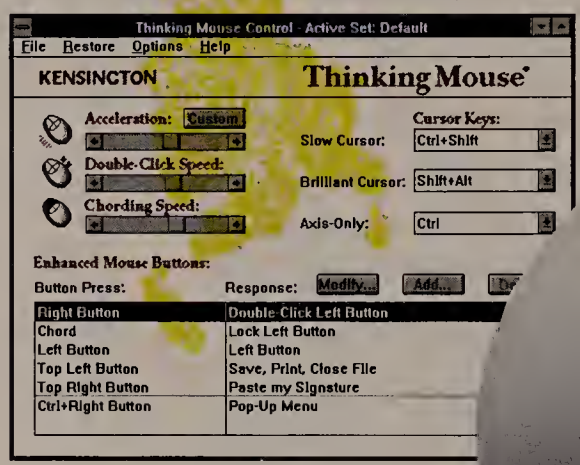
Introducing Thinking Mouse. The mouse designed for the way you work.

Unlike ordinary mice, Thinking Mouse is a *programmable* mouse. That means you can customize Thinking Mouse by assigning frequently used commands to different mouse buttons. And because each command executes with a single click, you work faster and save valuable time.



Thinking Mouse Control Panel

The way you program Thinking Mouse all depends on how you work. For example, you can open an application more easily by double-clicking with just one click. You can drag, scroll or highlight with less effort by locking a button down with just one click. You can even execute multi-step commands faster with a single click—like printing and saving a document, entering a block of text, logging onto a network, even sending a fax. The possibilities are endless.

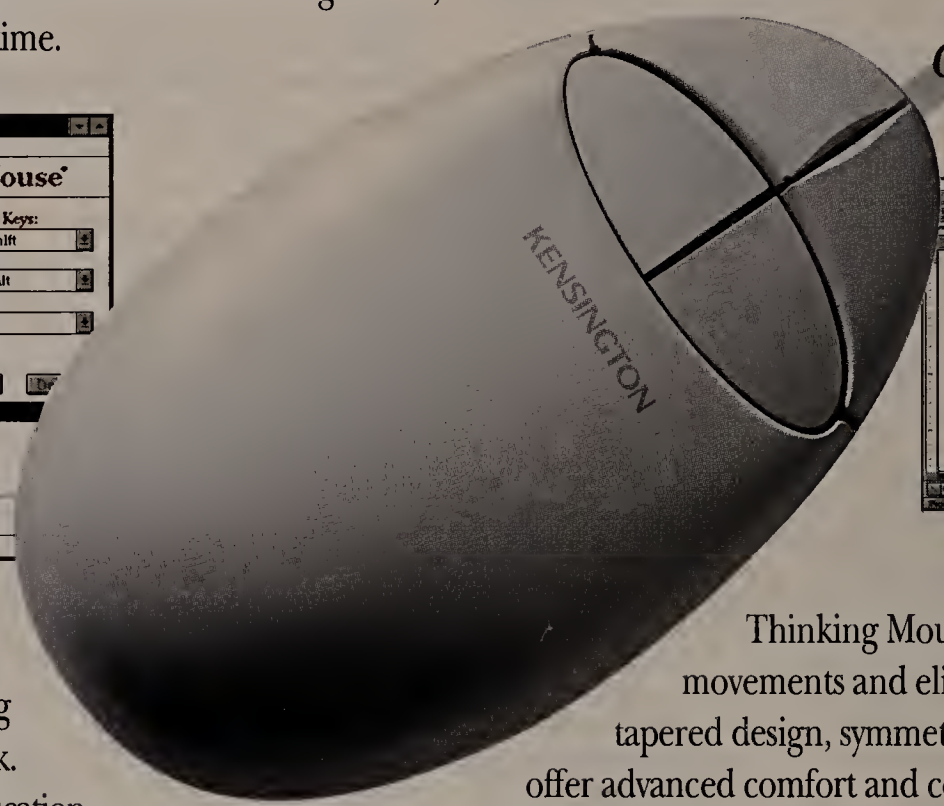
Create your own pop-up menu.

Want to save even more time?

Thinking Mouse lets you organize frequently used commands in a personalized pop-up menu.

First, you create the menu with our easy-to-use software. After that, simply click on the assigned mouse button when you want the menu to appear. Click once more to execute any command.

You can indent text, change fonts, even insert your signature into a document.



Comfortable. Fits most hand sizes. Satisfaction guaranteed.

Pop-Up Menu

Thinking Mouse saves time, reduces hand movements and eliminates many repetitive tasks. Its tapered design, symmetrical shape and EasyGrip™ sides offer advanced comfort and control for a variety of hand sizes, and for both right-handed and left-handed users.

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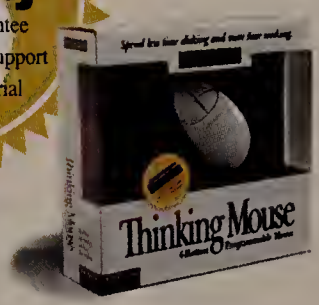

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OPERATING SYSTEMS SURVEY

Win a CD-ROM Drive and CD-ROMs

What are your plans with regard to the new 32-bit operating systems? We'd like to know so we can cover operating systems the way you'd like to see them covered. Fill out and fax in the questionnaire below—even if you have no plans to upgrade your current operating system—and we'll enter you in a drawing to win a Best Buy Plextor 4Plex CD-ROM drive, your choice of an application suite, and Microsoft Bookshelf.

HOW TO ENTER: Fax your completed questionnaire to *PC World* at 415/974-7367. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 1-OS, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by January 31.

PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact prize winners at the telephone and fax numbers they provide. If *PC World* is unable to do so within 30 days of the drawing, a substitute winner will be selected. No purchase necessary. Void where prohibited by law.

HOW TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

ABOUT YOUR CURRENT SETUP

Answer this section for the PC you use most often.

1. What operating system or environment do you use? (Check only one.)

○ DOS only
○ DOS with Windows 3
○ Windows NT 3.1
○ Windows NT 3.5
○ OS/2 2
○ OS/2 Warp version 3
○ Macintosh
○ Other

2. What size is this PC?

○ Desktop ○ Notebook/laptop ○ Hand-held

3. What is the CPU?

○ Pentium
○ 80486
○ 80386
○ 80286
○ PowerPC
○ Other Macintosh CPU
○ Other
○ Don't know

4. What is the capacity of the hard drive(s)?

○ Less than 120MB
○ 120 to 240MB
○ 241 to 340MB
○ 341 to 420MB
○ 421 to 540MB
○ 541 to 720MB
○ More than 720MB

5. How much RAM does this PC have installed?

○ 2MB
○ 4MB
○ 8MB
○ 16MB
○ 32MB
○ More than 32MB

6. How is it networked? (Mark all that apply.)

○ On a NetWare network
○ On a Windows for Workgroups network
○ On a Banyan VINES network
○ On a LANtastic network
○ On another type of network
○ Not on a network

7. Which software applications do you use regularly? (Mark all that apply.)

○ Word processing
○ Spreadsheet
○ SQL database
○ Other relational database
○ Flat-file database
○ Desktop publishing
○ Graphics
○ Accounting/financial
○ Communications/online services
○ E-mail
○ Programming software
○ Mainframe link
○ Other

8. Are these applications based in...?

○ Windows ○ Even mix of Windows and DOS ○ Mix of OS/2, Windows, and DOS
○ DOS ○ OS/2 ○ Other

ABOUT YOUR UPGRADE PLANS

Answer this section for all PCs you use or buy for.

9. Are you considering upgrading or changing your operating system?

○ Yes, on my home PC only
○ Yes, on work PC(s) only
○ Yes, on both work and home PCs
○ No

If you answered no, please skip to question 14.

10. What are you considering upgrading or changing to?

○ OS/2 Warp version 3 ○ Windows 95 ○ Windows NT 3.5 ○ Other

11. When do you plan to upgrade?

○ As soon as the operating system is available
○ 1 to 3 months after it's released
○ 4 to 6 months after it's released
○ More than 6 months after it's released
○ Not sure

12. What are your principal reasons for upgrading? (Mark all that apply.)

○ Improved interface
○ To take advantage of plug-and-play hardware
○ Lower memory requirements
○ Greater stability/crashproof
○ To run 32-bit applications
○ Preemptive multitasking
○ Remote access capability
○ To access the Internet
○ Faster performance
○ Ease of use
○ Becoming company standard
○ Built-in networking
○ Improved multimedia
○ Long file names
○ Other

13. After upgrading your operating system, how many applications do you plan to upgrade?

○ A few
○ As many as possible
○ All
○ None
○ Don't know

Please skip to question 15.

14. Why don't you plan to upgrade? (Mark all that apply.)

○ Happy with current operating system(s)
○ No compelling need to upgrade
○ Prohibitive cost
○ Compatibility issues with other users
○ Compatibility issues with hardware
○ Waiting to see if it's bug-free
○ Too few native 32-bit applications available
○ Machine not powerful enough
○ Not enough hard disk space
○ Don't have time to install or learn new operating system
○ Concerned about lost productivity in changeover
○ Other

15. What level is your job?

○ Executive management or business owner
○ Senior management
○ Middle management/supervisor
○ Nonsupervisory
○ Retired/unemployed

16. Do you work in your organization's IS, MIS, DP, networking, or microcomputer department?

○ Yes ○ No

17. How many people are employed at the company or organization where you work?

○ 1–9
○ 10–24
○ 25–49
○ 50–99
○ 100–999
○ 1000+

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Maximum Refresh Rate at Maximum Res. (Hz)	76	76	60	60
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

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Top 10 Graphics Boards: Matrox Shows True Colors

Windows may have brought vibrant color and graphics to the PC, but most people use only 16 or 256 colors. That's fine for juggling routine reports and spreadsheets, but graphics tasks such as desktop publishing and computer-aided design (CAD) need fast performance while displaying 16.8 million colors. We looked at three boards designed for heavy graphics—though their prices keep them off our Top 10—and also checked out two boards aimed at mainstream Windows users.

For graphics hounds, the $375 Matrox Impression Plus PCI stands out with its relatively low price, good performance in all graphics modes, and excellent display utilities—not to mention its 3-D acceleration capabilities for future graphics-intensive games and applications. The 2MB VRAM board's 77.4 overall score at 8-bit color in *PC World*'s Windows Integrated Test Suite (WITS) is competitive with those of Top 10 contenders. A 4MB version of the board ($575) sped through our tests at 24-bit color, delivering an astounding 91.4 WITS score.

The Matrox Impression Plus offers 3-D acceleration for future applications.

The $629 Radius Spectrum/24 VL, on the other hand, boasts 3MB of VRAM and earned an impressive 78.8 score when running WITS under 24-bit color. The board offers intriguing color-matching features for producing color output, but the proprietary chip can't display color settings below 24 bits—it requires a second VGA-compatible board to do so. Finally, the $899 MaxMedia CX/24 from UMAX uses three inexpensive S3 805 graphics chips and 6MB of DRAM to deliver a 74.4 WITS score in 24-bit mode, though 8-bit performance was an unimpressive 57.7.

For less-exotic work, the $120 Premier 1000 from Focus Information Systems is a bargain-priced accelerator based on ArkLogic's new 32-bit Ark1000 chip. Outfitted with 1MB of DRAM, the board achieved a 64.8 WITS score—better than most comparable 32-bit products that we've tested, but well behind Top 10 competition.

Finally, the 2MB Diamond Stealth 64 DRAM—the newest member of the Stealth family—uses S3's popular 864 chip and costs $199 on the street. But its 67.4 (PCI) and 65.3 (VL) WITS scores were disappointing, trailing those of its high-ranked peers, although the company has improved the software's ease of use.

WITS was developed by Jon Peddie Associates, a PC graphics consulting firm. Jon Peddie and Fred Dunn are the firm's principal officers.

TOP 10 ACCELERATORS

New this month · Up from last month · No change from last month · Down from last month

		Overall value	Estimated street price	Windows Integrated Test Suite scores: Word 2.0 for Windows	Excel 4.0 for Windows	CorelDraw 3.0	PhotoStyler 1.1	QuarkXPress 3.11	Freelance Graphics 2.01	Overall WITS score	RAM (MB/type)[1] Bus type	Chip/ driver date	Reader service number
1	ATI Graphics Xpression 905/882-2600	94	$225	13.4	16.6	13.2	11.6	15.6	4.8	75.1	2 / D PCI	88800CX 4/11/94	602
2	VidTech FastMax P20 800/752-8033	94	$189	13.1	16.2	13.4	11.5	15.3	6.6	76.1	2 / D PCI	Vision864 6/1/94	603
3	STB Powergraph Pro PCI 800/234-4334	93	$219	12.8	15.6	12.2	11.7	14.6	6.6	73.4	2 / D PCI	Vision864 5/9/94	604
4	STB LightSpeed 800/234-4334	92	$199	12.5	14.5	12.6	11.4	14.7	5.9	71.5	2 / D VL	ET4000/W32p 4/10/94	604
5	Hercules Dynamite Power PCI[2] 800/532-0600	91	$199	13.2	15.2	13.3	12.8	15.3	5.7	75.5	2 / D PCI	ET4000/W32p 5/11/94	605
6	Diamond Stealth 64[2] 800/380-0030	90	$315	13.5	17.9	13.1	11.2	12.9	8.5	77.1	2 / V VL	Vision964 4/1/94	606
7	Number Nine #9GXE64 800/438-6463	90	$249	12.8	14.7	10.3	11.5	14.3	6.5	70.1	2 / D PCI	Vision864 4/26/94	607
8	Number Nine #9GXE64 Pro 800/438-6463	90	$356	13.7	16.8	12.9	11.9	15.6	8	78.8	2 / V PCI	Vision964 4/26/94	607
9	Boca Voyager 407/997-6227	90	$145	12.6	13.8	12.8	11.6	14.1	4.6	69.4	1 / D VL	F64300 3/22/94	608
10	STB Nitro 800/234-4334	90	$189	12.2	13.4	13.1	12.6	14.7	4.1	70.2	2 / D PCI	GD5434 2/18/94	604

Methodology Except where noted in the text, boards were tested at 1024 by 768 resolution at 256 colors and a minimum 70-Hz refresh rate on a 486DX2-66 with 16MB of RAM and 256K of secondary cache. Application scores are the factor by which a board exceeds our baseline system, an unaccelerated ET4000-based VGA adapter on a 386DX-25 with 16MB of RAM. The overall value score balances performance, estimated street price, and features. The overall WITS score is the aggregate of the application scores. For all scores, higher is better.

[1] D = DRAM, V = VRAM.
[2] Similar value offered by other bus types tested.
For more information about all products in this table, circle reader service no. 901.

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INK JET PRINTERS

Laser Quality for $199

For churning out letters, charts, and spreadsheets, today's ink jets are a smarter choice than lasers—if you choose the right one. We review 10 models priced from $199 to $369.

BY WILLIAM HARREL

Testing by Ulrike Diehlmann and Kirk Steers. Research and support by Anita Hamilton, Caroline Jones, Melissa Riofrio, and Mike Salayko.

If you're in the market for a low-cost personal printer, there's no better deal than a monochrome ink jet printer right now. These increasingly sophisticated personal print engines sell for as low as $199 on the street, and they churn out business-quality letters and high-resolution charts that often look just as good as laser output.

We put the latest generation of monochrome ink jet printers to the test: ten printers from eight top vendors, with street prices ranging from $199 to $369. Three even offer low-cost color upgrades.

The Road Less Traveled

Low-end lasers are ink jet printers' chief competition. With certain 300-dot-per-inch (dpi) laser printers selling for only $399, and the priciest ink jet here going for $369, shouldn't you just eat the $30 difference, snap up a low-price laser, and call it a day?

Not necessarily. Low-end lasers are generally faster, and yes, for complex gray-scale graphics they produce better-looking output. But if you'll be using a personal printer primarily for text and charts, and your priority isn't blinding speed, an ink jet could be just what you need.

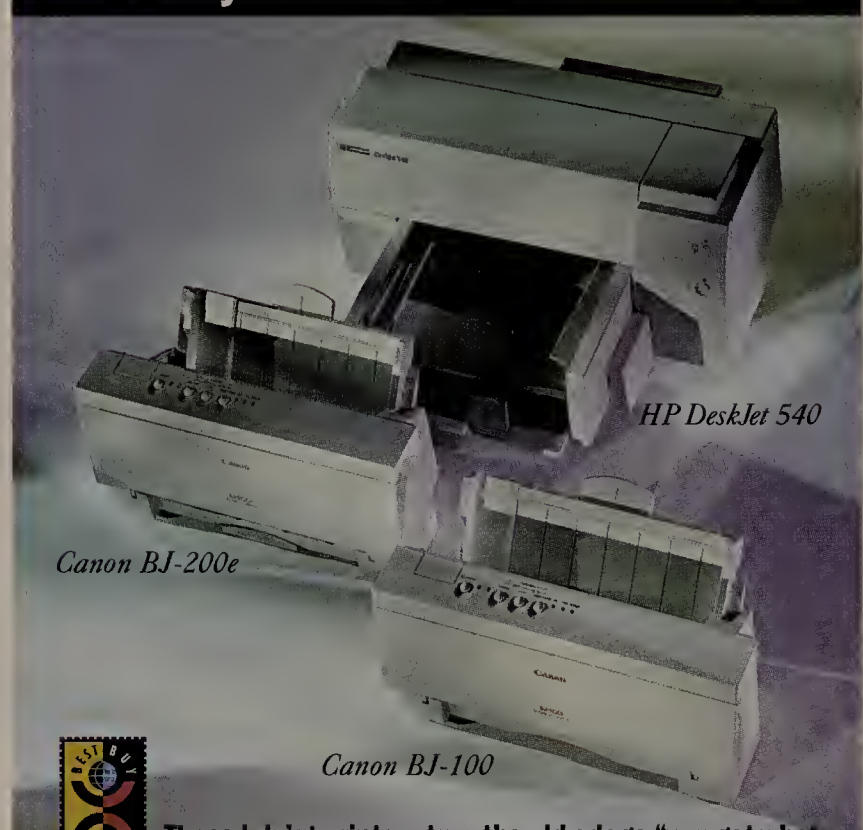
For one thing, cheap lasers aren't that fast. Indeed, the rated speed in low-quality draft mode for the fastest ink jet reviewed here, Digital's DECwriter 500i, is one page per minute (ppm) faster than that of typical low-end lasers, which rate at 4ppm. And if you look at pricier low-end lasers and cheaper ink jets, the price differential becomes much more significant. Based on average street prices, you can save about $265 going the ink jet route. Bear in mind, however, that the ink you buy for an ink jet printer costs more per page than toner for laser printers (see the sidebar "Do Ink Jet Printers Really Cost Less?").

Price is the primary reason most people turn to ink jets, but how much quality and ease-of-use do you sacrifice? What's the point of buying any printer if its output is no good, or if it's hard to operate? We made output quality and ease-of-use our main evaluation criteria, but we factored in speed, features, and support policies as well.

And the Winners Are...

Three printers stood out from the pack: Canon's BJ-100, Canon's BJ-200e, and Hewlett-Packard's DeskJet 540. Every one of these Best Buys produces great output and offers trouble-free installation and operation. At $199 the BJ-100 is the lowball champ. The BJ-200e costs a little more ($249) but provides slightly better output, a few more features (like an output tray and a driver with more controls), and one of the speediest test scores. Both machines boast compact, upright frames that occupy much less desktop space than their competitors. HP's $299 DeskJet 540 is great for novice users, thanks to excellent documentation, an online tutorial, and on-screen feedback about printing status. Its three-year warranty and low-cost color upgrade option are big pluses too.

Best Buys



These ink jet printers turn the old adage "you get what you pay for" on its ear. Two of the least expensive products in this review, the Canon BJ-200e ($249) and BJ-100 ($199), are far better values than units costing $100 more. Both Canons run well, print well, and sell for a nice price; who could ask for anything more? Our third Best Buy, the $299 Hewlett-Packard DeskJet 540, is an elegant and dependable workhorse, turning out consistently good-looking print jobs with little fuss.

The Eye of the Beholder

To evaluate output quality, we gathered a panel of end users to look at three different sample pages from each printer: a page of text, using two different fonts, printed on high-quality stationery; a page with text, bolded text, and a small spreadsheet, printed on less expensive copier paper; and a page with an organizational chart composed of text and shadow boxes drawn in two shades of gray, printed on coated ink jet stock.

While the sharpest text from the best of these ink jets (particularly the Canon BJ-200e) was virtually indistinguishable from that of a low-end laser, output on some others was problematic. Many judges noticed that letters were fuzzy and the liquid ink tended to seep outside the outline of individual characters and lines, especially on the Citizen Projet II and Lexmark ExecJet II. With half the printers—the C.Itohs, the Digital, the Epson, the HP, and the Lexmark—shaded areas in our organizational chart suffered from banding. Without exception, output appeared fuzzier on copier paper than on letterhead. The moral: To avoid unpleasant surprises, test the paper you plan to use before buying.

Getting Started

Setting up most of these printers is easy. Just connect the cable to the printer and your PC, insert the ink cartridge, and install the driver (software that enables your computer and printer to communicate with each other). The units from Canon, Epson, HP, and Lexmark come with install programs that painlessly walk you through the procedure. With the rest, you must use the printer dialog box in Windows' Control Panel. Incomplete or inaccurate documentation made installing the C.Itoh ProWriter SpeedJet CJ-300, Epson Stylus 800+, and Lexmark ExecJet II problematic.

To test paper-handling ability, we fed each unit copier paper, stationery, transparencies, envelopes, and labels. While most of the printers were able to print on copier paper and stationery without incident, the Citizen and Epson units were inept at feeding transparencies and labels. And while all these ink spritzers claim to do envelopes, they don't all perform with equal panache. The best envelope handling came from the Hewlett-Packard, the Lexmark, and the Canons, all of which boast multienvelope feeders that make printing envelopes a breeze. The Citizen, DEC, Epson, and Olivetti gave us trouble on envelope feeding.

Overall, the ease-of-use winners were the HP, the Lexmark, and both Canons.

Speed Thrills and Fancy Frills

Our application-based speed tests demonstrate dramatic performance differences among the ten ink jets we tested. Our speed champ, the Digital DECwriter 500i, blasted out a one-page letter in just 17 seconds, while the slowpoke C.Itoh CJ-300Lite took 50 seconds—nearly three times as long. Average speed was about 30 seconds for one page of text and about 80 seconds, on average, for a full page of graphics.

Extras abound. The HP comes with an excellent online tutorial that acquaints you with printer features and shows you how to use them. The Epson and HP machines boast bidirectional parallel ports, which let your PC keep you updated on printing progress.

The DEC, HP, and Olivetti printers offer color upgrade options for $49 to $59. A two-year warranty, toll-free tech support, and fast repair turnaround are pluses for the Canons and the Epson. And no one beats HP's three-year warranty.

What's Next?

Ink jets are excellent values. According to printer analyst C. J. Meiser, formerly of BIS Strategic Decisions, the year 1995 will see low-cost laser printers fall to second market position as ink jets move into the lead. Meiser thinks prices on these lasers are as low as they will go. So if you've been waiting to buy a printer in hopes that laser prices would drop below ink jet prices, it may be time to rethink that strategy. According to the experts, ink jet printers will *always* be cheaper than lasers, because ink jets cost less to manu-

facture than laser printers. With great choices like our Best Buys, there is no longer any reason to wait. Period.

William Harrel is a freelance writer who has written many books on desktop publishing and graphics. His latest book is CorelDraw 5.0 Revealed *from Prima Publishing. Testing was done by Ulrike Diehlmann and Kirk Steers of the PC World Test Center, with research and support by Anita Hamilton, Caroline Jones, Melissa Riofrio, and Mike Salayko of the* PC World *editorial staff.*

Canon BJ-100

PROS: Ties for best output, great manual, lowest price, compact design
CONS: Sparse controls, no output tray

The $199 Canon BJ-100 is a scaled-down version of the BJ-200e (reviewed next), providing roughly the same output quality for $50 less. Print quality is top-notch from both Canons—text, especially, is crisp and clear. What you sacrifice with this printer is speed: Overall, the BJ-100 performs about a third slower than its pricier sibling, and it ranks a little below average when compared to other printers.

On the other hand, the BJ-100 adroitly handles all types of print media. Transparencies and labels feed through the device as easily as a hot knife cuts butter. And the input tray handles envelopes just as well as it does paper.

Sleek, small, and sturdy, the BJ-100 weighs only 6.6 pounds and measures just over a foot in length, making it ideal for cramped desktops. One reason it's so short is that it lacks an output tray. Plan on using your own paper tray to catch sheets, or let them fall where they will. The unit also lacks a low-ink indicator and a reset button.

Despite its merely decent performance and lack of an output tray, the Canon BJ-100 is a winner: its great price, fine output quality, and outstanding ease-of-use make it a fabulous buy. *Canon Computer Systems, 800/848-4123; 714/438-3000* **Reader service no. 748**

Canon BJ-200e

PROS: Fast, ties for best output, great manual, compact design
CONS: Sparse controls

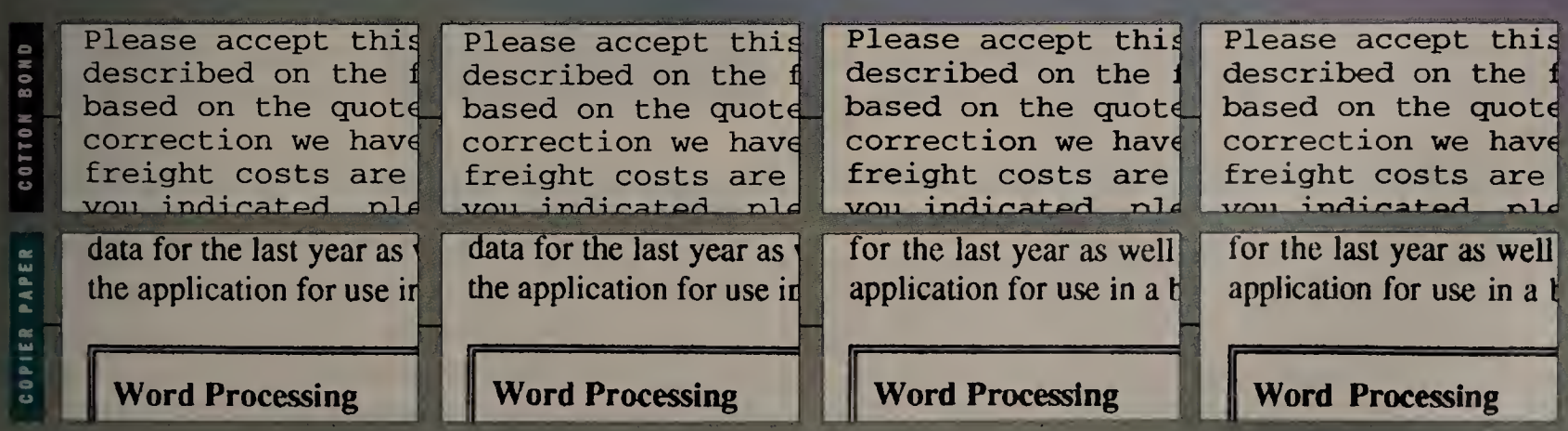
Every bit of praise we lavished on the BJ-100 applies to the BJ-200e, and then some. Canon's BJ-200 was a Best Buy in our January 1994 roundup—and the $249 "e" (for enhanced) gets the nod again. Not only did it place in the top three on almost all our speed tests, it also produced some of the best-looking output. The formatted text quality from both Canons is closer to laser caliber than any other printer reviewed here.

You also get an output tray with this printer—if that's what you want to call the flimsy piece of plastic that slides out from the front of the printer. At least it reserves a place on your desktop for printed pages and keeps them from falling to the floor.

Alas, when you pack all this punch into so small a box, something's got to go. What went (on both Canons) were amenities such as a low-ink indicator and a reset button. The excellent print quality and the overall performance of the BJ-200e, however, outweigh these small drawbacks. *Canon Computer Systems, 800/848-4123, 714/438-3000* **Reader service no. 749**

Output Quality: Paper Plays a Role, Too

It's not easy being an ink jet printer: Having to produce crisp output by spraying wet ink onto porous paper is no trivial task. Even for the simplest application—printing letters and documents on copier and stationery paper—some of these printers yielded fuzzy borders and bleeding characters. The two Canons and the HP earned top marks for output, but others, like the Citizen Projet II and Lexmark ExecJet II, fared worse. Paper type plays a big role in output quality, so bring some of your own and test the printer at the store. For example, the cotton bond stationery paper we used in our tests yielded better results than the copier paper we tried, but sometimes the absorbency of cotton will exacerbate the bleeding problem. Also, text printed using the Courier font, which is widely used and often comes preinstalled on printers, looked better than samples using the less common Galliard font.



Canon BJ-100 *Canon BJ-200e* *HP DeskJet 540* *Citizen Projet II*

Citizen Projet II

PROS: Sleek design

CONS: Poor output and paper handling, no toll-free support

Looks aren't everything. The $249 Projet II boasts a visually striking design, but given a choice, we'd prefer a printer that looks like a mud hen and glides like a swan rather than the reverse. The Projet's output is mediocre at best, and printing on anything except plain paper is difficult.

Even installing the Citizen can be frustrating. One of the two identical units that we tested refused to print without jury-rigging the settings—under instruction from Citizen technical support.

While the printer handled regular 20-pound paper and envelopes without incident, it choked on labels and transparencies. We finally succeeded with these by using the manual feed tray—but they are supposed to feed automatically. And the output tray is inconveniently located in the back.

Considering you can pick up a great, dependable printer—the BJ-200e—for the same price, this unruly Citizen is not a smart buy. *Citizen America, 800/477-4683, 310/453-0614* **Reader service no. 750**

C.Itoh ProWriter SpeedJet CJ-300

PROS: Respectable output, reasonably fast, sturdy construction

CONS: Outdated manual, a little pricey

The ProWriter SpeedJet CJ-300 is a sturdy workhorse that churned through our tests with ease and fared reasonably well on output quality. But it misses Best Buy status because, at $325, it's not cheap; its installation is problematic; and support policies could be better.

Things get off to a bad start when the manual, which seems to be outdated, instructs you to select an HP DeskJet driver from Windows' Printers dialog box—ignoring the printer-specific drivers that come with the printer. Once you manage to get the CJ-300 installed, however, things improve fast. Transparencies slide through without incident, and sheets of labels feed without jamming. Envelopes print flawlessly too, though you must insert them manually. This is how a printer should work: painlessly.

Two external slots accommodate font cartridges or memory upgrades, both of which can enhance the printer's speed. While the slots are a plus, the CJ-300 lacks other amenities, such as a multiple-envelope feeder. The printer's warranty is limited to one year, and technical support is available during West Coast business hours only. (At least it's toll-free.) The CJ-300 works well, but its high price would be justified only if installation, features, and support were up to snuff. *C-Tech Electronics, 800/347-4017, 714/573-4604* **Reader service no. 751**

C.Itoh ProWriter SpeedJet CJ-300Lite

PROS: Good print quality, sturdy construction

CONS: Slowest unit reviewed

A stripped-down version of the CJ-300, the ProWriter SpeedJet CJ-300Lite costs about $75 less and provides about 75 percent of the features. Its output quality is roughly the same, and both printers are equally dependable. What you give up are speed and slots. The $249 CJ-300Lite was almost half as fast as its big sibling on all tests, placing last overall. And lacking expansion slots, the CJ-300Lite is unable to accommodate either the memory upgrades or the font cartridges that many users find desirable.

Moreover, this printer suffers from the same unimpressive support policies—a one-year warranty—as the CJ-300. While it does deliver decent output quality, and seems quite dependable, we don't consider it much of a bargain. *C-Tech Electronics, 800/347-4017, 714/573-4604* **Reader service no. 752**

Digital DECwriter 500i

PROS: Fast, high-capacity input tray, color upgrade available

CONS: Poor output quality, most expensive unit reviewed, poor envelope handling

This is the fastest printer in the roundup, rolling out pages more than three times as fast as pokier models. At $369 it's also the most expensive—and output quality leaves a lot to be desired. Simple text looked mediocre, and more demanding print jobs fared worse.

The DECwriter has a sleek, typewriterlike design; input and output trays are conveniently located in front; and while the generous 150-sheet input tray looks a little flimsy, it loads and feeds smoothly. The printer also sports paper-out and low-ink lights.

It had no trouble with transparencies or labels, but we ran into problems printing envelopes. Sometimes they turned sideways when feeding, or simply crumpled and jammed; the manual was no help. Impressive speed can't make up for the DECwriter's high price, spotty media handling, and dicey print quality. If you want a fast printer, buy a laser. *Digital Equipment, 800/777-4343* **Reader service no. 753**

Epson Stylus 800+

PROS: Elegant software interface, built-in scalable fonts, bidirectional parallel port

CONS: Paper handling problems, incomplete installation instructions

This machine is truly a mixed bag. Middle-of-the-road performance and merely decent print quality knock Epson's $299 Stylus 800+ out of the Best Buy circle—but it still wins kudos for an unusually cool software interface. It's an on-screen interface that provides context-sensitive help. It lets you use the keyboard to

adjust every aspect of printing and keeps you informed of print status in detail. There's a small catch, however: The Epson turns off Windows' Print Manager. It provides its own spooler, which seems to work fine, but you have no choice in the matter—the installation program will insist on installing it, plus the status-report interface software. Oh, well. One nice touch: Four of the Epson's six fonts are scalable.

On the other hand, the installation instructions in the manual are incomplete. They don't tell you to remove the cardboard under the ink cartridge holder—a serious oversight that can damage the printer. Instructions for installing the Windows driver are sparse.

The regular paper tray works fine, but using the manual sheet feed was tricky; envelope printing took constant supervision; and transparencies and labels jammed far too often. It's a shame, since the Stylus 800+ is a decent printer, and the interface is a real joy. *Epson America, 800/289-3776, 310/782-0770* **Reader service no. 754**

Hewlett-Packard DeskJet 540

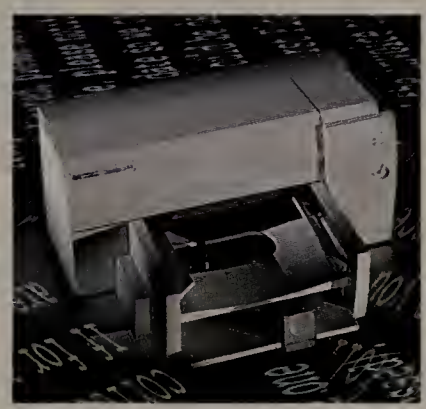
PROS: Impeccable paper handling, best output, three-year warranty.

CONS: Slow, pricey, no toll-free support

For many years, Hewlett-Packard's DeskJet printers have been among the most popular ink jets around, and the latest iteration, the DeskJet 540, shows why. Output quality is excellent, and it does well in every category except speed. The 540's poky performance—it rated midpack or lower on all but the WordPerfect benchmark—is a stumbling block, but the ease with which it handles all media, including paper, envelopes, labels, and transparencies, makes up for it. You also get a standout three-year warranty. A unique interface and idiotproof documentation are additional reasons for awarding this product a Best Buy.

Our favorite feature is the DeskJet 540's multiple-envelope feeder, something that's offered by only three other units in our roundup. HP's feeder is particularly well designed—and considering that you'll probably use it every day, that's a big plus. We were also impressed by the HP's online tutorial and manual; their clear, thorough explanations make this an ideal printer for the novice user. As soon as installation is complete, an animated presentation appears that describes all the features and explains how to use them. Online help is available at all times, and the bidirectional parallel port means the printer software can use clear, on-screen messages to keep you informed of print status and problems.

The only things we don't like about this printer (aside from the tedium of waiting for pages to appear) are the lack of toll-free tech support and the relatively high price: $299. But considering the DeskJet 540's many fine qualities, we rate this more than a fair trade, and well worth a Best Buy. *Hewlett-Packard, 800/752-0900, 800/387-3867 (Canada)* **Reader service no. 755**



Lexmark ExecJet II

PROS: Fine media handling, easy to use, high-capacity input tray

CONS: Poor quality output, unclear installation procedure, no toll-free support number

Lexmark's $279 ExecJet II excels in many respects. It prints labels and transparencies as easily as a one-page letter on copier paper, and printing envelopes is a breeze with its 15-sheet feeder. From the flip-up front panel, you can control fonts, page orientation, and many other options with the touch of a button. The printer comes

Consumables: Do Ink Jet Printers Really Cost Less?

Ink jet printers are cheaper to *buy* than lasers, but they cost a lot more to operate. So how does that compute? Is buying your own ink jet printer really a savvy move?

You bet.

The typical street price for a personal laser printer is around $550, whereas ink jet printers average about $285. That means you will save about $265 by going with the ink spritzer. How long, then, can you use it before its higher per-page costs eat up your savings?

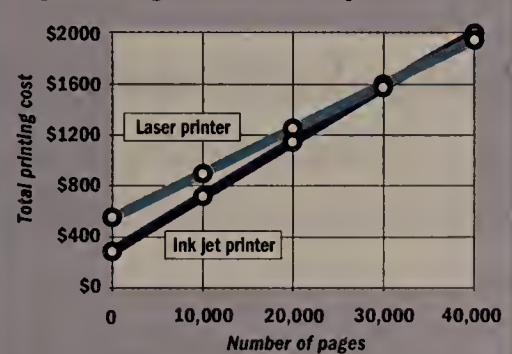
Based on print covering 5 percent of the page (that is roughly what's on a double-spaced manuscript page), the cost per page (toner and paper) for a laser printer is about 3.5 cents. Printing the same page on an ink jet will cost 4.3 cents for ink and paper. (Consumables for color ink jet printers cost much more than for black-and-white printers. And remember to buy coated paper for the best-looking color output.)

That means you'll pay about $175 to print 5000 pages on a laser, and $215 to print the same number of pages on an ink jet. So...by the time you've printed "only" 33,000 pages the ink jet will end up costing you the same as a low-end laser (see chart).

That's right, 33,000 pages. How many pages do *you* print in a day? Industry pundits figure that most personal ink jet users average no more than three pages a day, or 15 pages per work week. Just for fun, let's assume your printing load is double that. Even so, it will take you more than *21 years* before your ink jet crosses the laser cost line. It's hard to imagine a laser *or* an ink jet lasting that long.

Any more questions?

Operating Costs Compared



Total printing cost starts with the average purchase price of the printers at the zero point. You have to print at least 33,000 pages before an ink jet costs more to operate than a laser.

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- 8MB RAM expandable to 24MB
- Two PCMCIA slots (16mm and 5mm)
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- Integrated graphics accelerator
- 65,536 (64K) simultaneous colors
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- 6.9 lbs.
- NiMH battery for extended life
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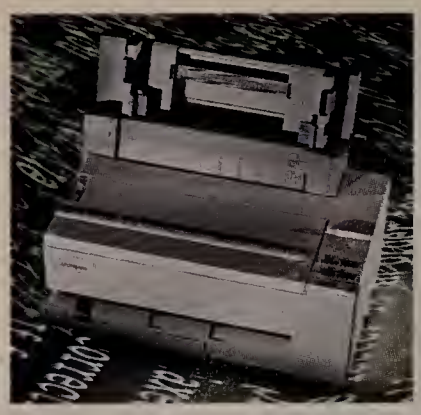


with 12 built-in scalable fonts, and you can add a 1MB flash memory card for storing additional typefaces.

Alas, the Lexmark fared badly on our output tests. Streaks and blotches marred the graphics, while text characters were thick and blurry, especially on stationery.

Installation is another problem. Lexmark's setup utility works fine for for DOS applications, but you'll have to install the Windows print driver yourself—and search several disks for it, since the manual does not even *name* the required file.

Lexmark's repair policy is outstanding, however. If your printer fails, a simple phone call (and proof of purchase) will get a new machine sent out to you on the same day. Lexmark is the only vendor here that provides this service.

Maybe a happier ending is in store. At press time, Lexmark had replaced our contender with a new model, the ExecJet IIc. This printer has an expected street price of $369 and separate cartridges for black-and-white and color output. We hope that the new generation evolved with better output quality and better Windows installation. *Lexmark International, 800/358-5835, 606/232-2000*

Reader service no. 756

Olivetti JP 450

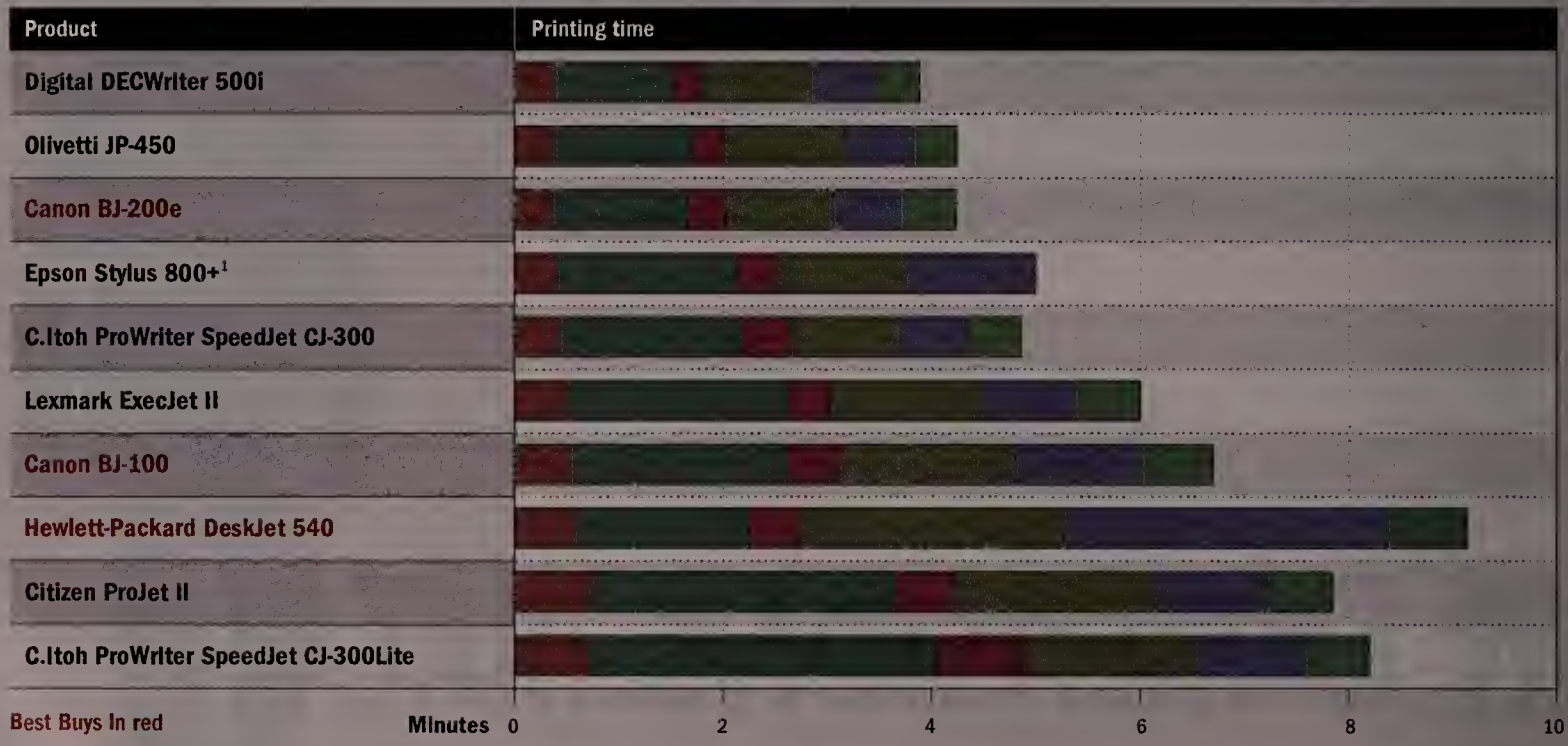
PROS: Fast, easy to install and use, color upgrade available, high-capacity input tray

CONS: Expensive, envelopes hard to print, poor support policies

Olivetti's $349 JP 450 is the second-fastest printer in this review, placing just behind the Digital DECwriter 500i—which should come as no surprise, since the printers are nearly identical. You get the same sleek, typewriterlike design and easily accessible paper trays. The Olivetti has a

TEST REPORT: INK JET PRINTERS

Canon BJ-200e Excels in Speed and Print Quality



[1] Unable to work with Photoshop on our test: updated drivers corrected the problem.

Machines ordered by overall performance from best to worst, based on normalized weighted scores from six tests. A printer may have a better overall rating than another that took less time to complete our suite.

Methodology

All testing was performed on a Compaq DeskPro with a 486DX2-66 processor, 8MB of RAM, and a 540MB Western Digital Caviar 2540 hard drive. After each printer was tested, the hard disk was reformatted, and Windows and all test applications were reinstalled. During testing, the default installation of the application was used. Every print setup was set to letter-size paper, letter or final print quality, and the automatic sheet feeder option. The paper type was set to normal.

Microsoft Excel 4.0
We printed a quarter-page table of data, using the TrueType Arial font, on plain paper.

WordPerfect 6.0 for Windows
We printed a three-page formatted document, with a variety of font sizes, on plain paper.

Microsoft Word 6.0 for Windows
We printed a one-page letter on cotton bond paper in two fonts: printer-resident Courier and nonresident Galliard.

CorelDraw 5.0
We printed a one-page color movie poster on coated ink jet paper.

Harvard Graphics 3.0
We printed a one-page color slide depicting an organizational chart, with a title and a gradient background, on coated ink jet paper.

Adobe Photoshop 2.5.1
We printed a half-page gray-scale photographic image on coated ink jet paper.

All tests conducted by the PC World Test Center.
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few more fonts and different drivers, and exterior controls are arranged differently than on the Digital; but the printers cost about the same, and both offer an inexpensive color upgrade. Unfortunately, our judges also rated them nearly the same in output quality—the Olivetti, too, suffers from mediocrity.

Labels and transparencies feed well, but getting envelopes to go through the machine requires some patience. And the documentation offers so little help with envelopes that you may do better to address them by hand—or print the addresses on labels instead.

Olivetti's service and support policies are gravely deficient compared to the norm. Toll-free support is available *only* if you buy the printer directly from Olivetti; otherwise you must rely on getting help from your dealer. Moreover, Olivetti's turnaround time on repairs is a whopping two weeks—that's more than three times longer than any other in this review.

Speed can take you only so far; the Olivetti JP 450's high price and meager service and support make it a poor value. *Olivetti Office USA, 800/243-3234, 908/526-8200* **Reader service no. 757**

FEATURES COMPARISON: INK JET PRINTERS

Best Buys All Sell for Under $300

● Yes
○ No
n/a = not applicable

	BEST BUY Canon BJ-100	BEST BUY Canon BJ-200e	Citizen Projet II	C.Itoh ProWriter Speedjet CJ-300	C.Itoh ProWriter Speedjet CJ-300Lite	Digital DECwriter 500i	Epson Stylus 800+	BEST BUY Hewlett-Packard DeskJet 540	Lexmark Execjet II	Olivetti JP 450
Standard features										
Street price[1]	$199	$249	$249	$325	$249	$369	$299	$299	$279	$349
Street price of ink cartridges	$25	$25	$8	$35	$35	2 for $12	$12	$19	$31.95	2 for $9.95
Cost per page (cents)	5	5	3	3	3	2.5	2.5	3.2	3.2	2.5
Maximum resolution (dpi)	360 x 360	360 x 360	300 x 300	300 x 300	300 x 300	300 x 300	360 x 360	600 x 300	600 x 300	300 x 300
Standard memory (K)	50.4	49	128	16	16	128	32	512	21	128
Enhanced graphics settings	●	●	●	○	○	○	●	●	●	○
Color upgrade/street price	○ / n/a	○ / n/a	○ / n/a	○ / n/a	○ / n/a	●/$50	○ / n/a	●/$49	○ / n/a	●/$59
Design and paper handling										
Width x depth x height (inches)	13.7 x 6.8 x 7.6	13.7 x 6.8 x 7.6	5.5 x 14.5 x 13.5	15.7 x 13 x 5.6	15.7 x 13 x 5.6	15.2 x 14.4 x 6.9	6 x 17 x 10.4	17.2 x 7.9 x 16	14.3 x 11.1 x 10.6	15.2 x 14.4 x 6.9
Weight (pounds)	6.6	6.6	8.8	12.1	12.1	11	10.6	11.6	11	11
Additional paper sizes supported	[2]	[2]	[2]	[2]	[2]	[2]	B5[2], executive	[2]	B5[2], executive	[2]
Input tray capacity (sheets)	100	100	70	100	100	150	100	100	150	150
Envelope feeder capacity (sheets)	15	15	n/a	n/a	n/a	n/a	n/a	15	15	n/a
Bidirectional parallel port	○	○	○	○	○	○	●	●	○	○
Reset button	○	○	○	●	●	○	●	●	●	○
Incoming data indicator	○	○	○	●	●	○	●	●	●	○
Paper-out indicator	○	○	●	●	●	●	●	○	○	●
Low-ink indicator	○	○	●	○	○	●	●	○	●	●
Miscellaneous										
Ships with drivers for										
WordPerfect 5, 6	●	●	●	○	○	○	●	●	●	○
Lotus 1-2-3 version 3.1, 3.1+	●	●	○	○	○	○	●	○	●	○
Emulates HP DeskJet series	○	○	●	●	●	●	○	●	●	○
Bit-mapped/scalable internal fonts	7/0	7/0	6/0	4/0	3/0	10/0	7/4	4/14	2/12	14/0
Service and support										
Warranty (years)	2	2	2	1	1	2	2	3	2	1
Toll-free technical support	●	●	○	●	●	●	●	○	○	●[3]
Weekday support hours	15	15	8.5	9	9	11.5	12	12	9	7.5
On-site service	○	○	○	○	○	○	○	○	○	○
Average turnaround on repairs (days)	1	1	2	3	3	2	2	1	1[4]	14
Fax support/BBS	●/●	●/●	●/●	●/●	●/●	○/○	●/●	●/●	●/●	●/○

[1] All prices are estimates gathered on 9/1/94. Each price was either supplied by printer vendor or gathered by PC World researchers.

[2] All printers support letter, legal, A4, and envelope sizes.

[3] Support for direct buyers only.

[4] Replacement sent immediately upon proof of purchase.

For more information about all products in this table, circle reader service no. 910.

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PC Computing, July 1994

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PC Magazine, June 14, 1994

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WordPerfect InfoCentral 1.0	5.5

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WORKGROUP COMPUTING

SPECIAL REPORT

EXPLOIT YOUR NETWORK TO SOLVE YOUR BUSINESS PROBLEMS

226 Five Great Workgroup Packages That Boost Your Productivity

239 Delivering Applications With Lotus Notes

Edited by Eric Bender

Illustrations by John Ritter

"There are two kinds of companies. The quick and the dead.

The power of Notes is the power of a smarter, faster organization.

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Andy Grove, CEO

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Lotus

Working Together

ly (for example, you send mail via Tags• Notify Others rather than File•Send Mail), and both online help and printed documentation lack depth. Also, although Network Central makes it easy to tag files, if you're on a server-based network and the files are on your hard drive, you must manually copy them to the network before others can access them. And there's no dial-in support. But despite these glitches, there's nothing like Network Central for learning to share all by yourself. **—Eric Bender**

Network Central

Manage, share, and annotate documents with other members of your workgroup.

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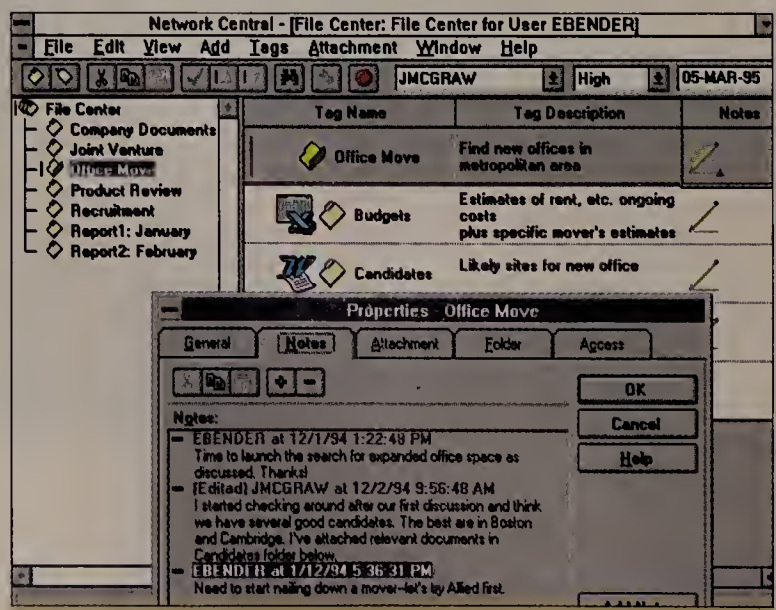
800/639-6387, 415/968-1101

Reader service no. 705

ECCO PROFESSIONAL

The Workgroup Information Manager

With version 2.0, Ecco Professional makes the leap from personal information manager (PIM) to workgroup information management program. But don't call it a WIMP—besides keeping your schedule and maintaining your contacts, this information manager from NetManage (which recently bought Arabesque Software) lets everyone in your workgroup coordinate their calendars as well as share phone books and other data. A set of file synchronization tools lets you orchestrate your affairs from afar.



YOU CAN INSTALL Network Central yourself, then share, annotate, view, and search for files within your workgroup.

Workgroup applications let you collaborate with colleagues, share information and resources, and manage group projects—with very little fuss.

On its own, Ecco enjoys a strong standing in the PIM community. (Arabesque Ecco Professional 1.1 was voted a *PC World* 1994 Best Product in the July issue.) On your network, Ecco stores shared documents—including calendars, phone books, and outlines—in a common directory. The program can use any E-mail system to manage group scheduling. We tested Ecco with cc:Mail.

To schedule a meeting, you select the *Add Group Meeting* option from the Calendar view. You then specify the time, date, duration, attendees, and resources such as meeting rooms and equipment. Ecco takes a look at each participant's calendar and alerts you to any conflicts. If any are found, Ecco identifies the next available time slot.

Ecco then sends notification messages that pop up in a Meeting Mail window, and recipients can accept, decline, or "pencil in" the meeting, or name an alternate attendee.

Users can make their files available to others by assigning individuals access privileges. For example, with the appropriate access, you can open and read or modify another person's schedule (although you don't need this access to schedule meetings). However, a Make Private option enables you to hide material—even a single item—in a shared file.

At home or on the road, you'll appreciate Ecco's ability to keep your office and remote machines on the same wavelength via file synchronization. Create *replicas* of your files—copies that can be synchronized with the originals—and you can synchronize either from the office network or remotely using E-mail or a remote-access program.

Installing Ecco is easily managed by anyone who can create a network directory and specify the network's E-mail system. If you use a peer-to-peer network such as Windows for Workgroups, you may need to make minor (but well-documented) adjustments to your WIN.INI file.

Good on-screen cues plus well-indexed documentation get you up and running fairly quickly, but true mastery takes time and effort. Ecco displays and cross-references unstructured data with the best of them, but the price of increased power is a steep learning curve. Using the advanced features—such as creating a custom outline and linking it with the calendar and phone book—can be a challenge. But when your workgroup starts humming like a well-oiled machine, you'll find Ecco Professional 2.0 is worth the effort. **—Jennifer Smith**

Ecco Professional 2.0

Group scheduling, data sharing, and file synchronization turn Ecco Professional 2.0 into a capable workgroup information manager.

Installation: Piece of cake; requires only a shared network directory and the name of your E-mail system.

List price: $279

NetManage

800/457-4243, 206/869-9600, 206/885-0127 (fax)

Reader service no. 704

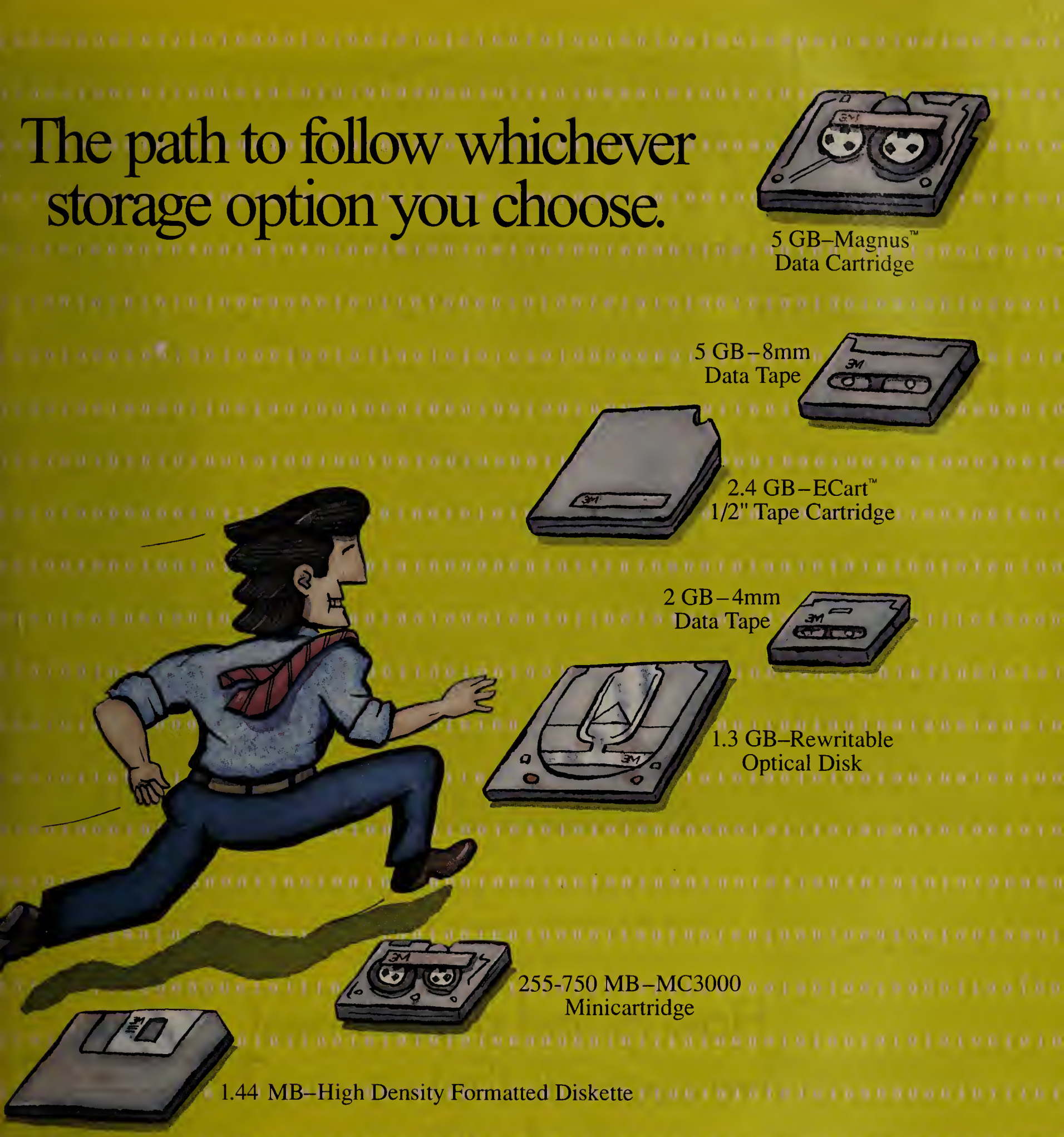
WANDERLINK

Making Offsite Work Remotely Possible

You *try*. When you leave the office, you really try to take every file you could possibly need, and you try to cram your notebook or home PC with every possible application. But you still find yourself wishing for your office PC with all your files, applications, and network resources at hand.

WanderLink from Funk Software solves this problem by giving you remote access to your office PC whether you're at home, on the road, or at a client's office. You can dial into the network and retrieve files, kick off a lengthy print job, catch up on your E-mail, or do just about anything that you do with your office PC. The cost is surprisingly low, starting at $295, and you might even save

The path to follow whichever storage option you choose.



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3M *Reliability*

Circle 208 on reader service card

How to find a document in five seconds that no one has seen in the last five years.

(Or the last five mergers.)

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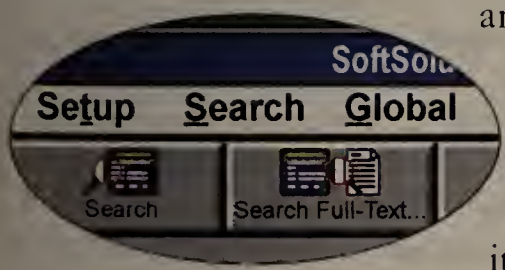
Without committing a weekend to deep storage or rifling through every database on the network, the answer is quite simple—provided you have SoftSolutions, a unique document management application in the family of Novell® GroupWare. With one simple keyword entry, you can search and retrieve any information (text, graphic or video) from across most popular applications, platforms and databases. Even if you don't remember who wrote it, when it was written or where it was filed. SoftSolutions will even prioritize similar requests, significantly reducing retrieval time. And SoftSolutions can be used to guard information from unauthorized access. Which might come in handy in the event of merger number six. Call **1-800-370-8992** for your nearest certified reseller or to learn more about Novell GroupWare, the perfect way to put people together with information.



GroupWise 4.1—Comprehensive integrated E-mail, calendaring, scheduling and task management. GroupWise 4.1 enables you to share information across almost any platform, gateway or network.

InForms—More than an electronic forms program. Now you can create and design forms and views, access multiple databases in real time and, via E-mail, digitally sign forms requiring immediate approval.

SoftSolutions—The leader in document management solutions. You can secure information and access data (text, graphic or video) anywhere on the network, regardless of its application or platform.

GroupWise

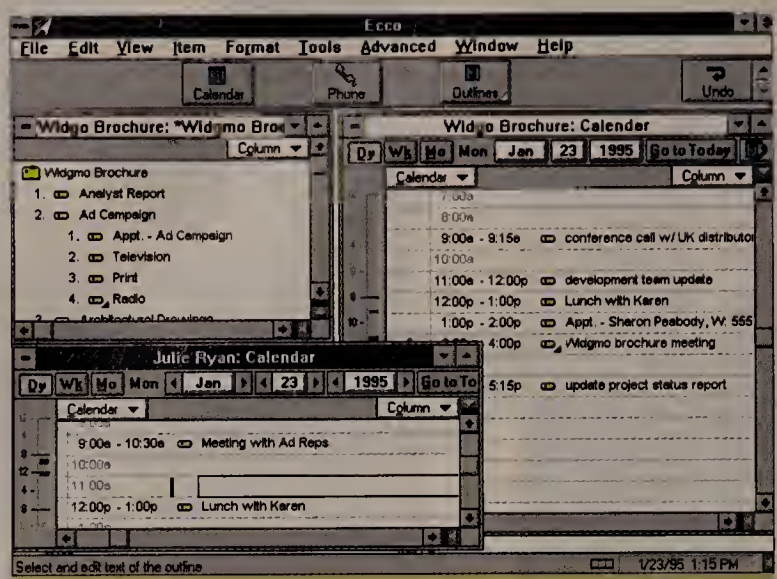
InForms

SoftSolutions

SoftSolutions™

NOVELL

GroupWare



ECCO LETS YOU SHARE calendars and crucial information, such as customer interactions, with your co-workers.

some bucks since you won't have to buy remote versions of your E-mail and workgroup applications.

Traditional remote-control programs need a dedicated PC for every incoming phone line, but WanderLink is a software-only product that lets you connect to any server running NetWare 3.*x* or 4.*x* and outfitted with a modem. Then you can use your remote PC as if on the network (as a remote node), or run a network PC at the office by remote control from home.

With the remote-node approach, your remote PC has all applications installed locally and dials in only to transmit data. This is an optimal approach for mail, groupware, or client-server database applications, since the modem line becomes like a network cable to the remote PC—albeit a long and slow network cable.

WanderLink's client software, available in either a DOS or a Windows version, is intuitive. Specifying the server, phone number, and log-in information is simple as is adding features like speed-enhancing compression.

You first connect and log into a server as a remote-node user. If you want to remotely control your office PC, you then launch Proxy, a remote-control package bundled with WanderLink. Proxy has its share of virtues and shortcomings. One surprising glitch is that you can't transfer files between the networked host PC and the remote PC in remote-control mode. Instead you must switch to a remote-node connection and transfer the files from there.

Remote access via modem is always painfully slow, but WanderLink helps by compressing and decompressing transmitted data. WanderLink uses the server's processor for this crunching, so a server busy with many incoming calls may bog down.

WanderLink doesn't let you dial out from the network, and it doesn't support Macintoshes or workstations that use the TCP/IP protocol. But its cost is strikingly low. A license lists for $295 for 1 port, $395 for 2 ports, $595 for 4 ports, $995 for 8 ports, and $1695 for 16 ports.

Overall, WanderLink is a good choice when you need to access your network remotely—and its low cost and relative simplicity make it appealing even on small networks. **—Bill Lawrence**

WanderLink

Access office workstations through a dial-in remote connection over a NetWare LAN.

Installation: Simple for clients; the server software installs on NetWare server relatively easily.

List price: $295

Funk Software, Inc.

800/828-4146, 617/497-6339, 617/547-1031 (fax)

Reader service no. 706

WINFAX PRO FOR NETWORKS

Faxes for the Masses

Although fax-modems are becoming as common as telephones, few businesses will equip everyone with a phone line to take advantage of them. Delrina's WinFax Pro for Networks 4.0, with a starting list price of $399, lets your entire workgroup share a single fax-modem over a network.

WinFax Pro offers all the features of the stand-alone program (WinFax Pro 3.0 was a *PC World* 1994 Best Product winner) as well as a whole lot of handy bells and whistles; it's a must for any workgroup that regularly sends and receives faxes.

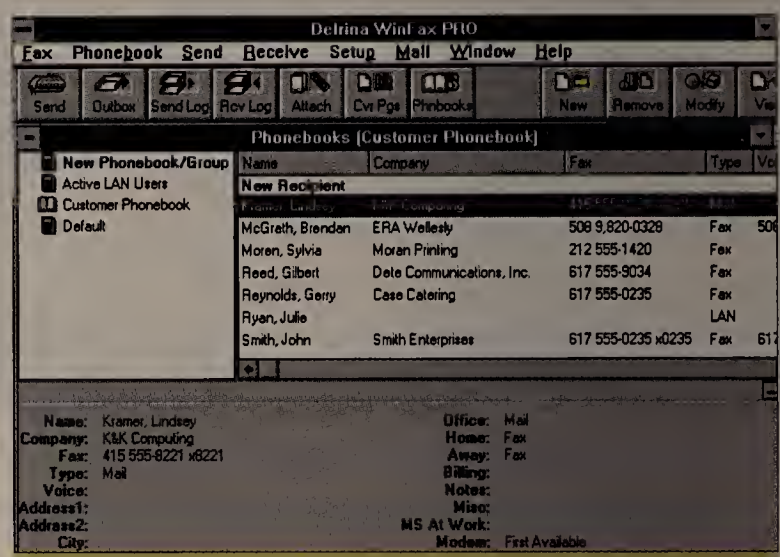
If your workgroup receives a lot of faxes, you can designate a workstation as the "fax receptionist" and assign someone to receive and distribute them. (They can be forwarded via WinFax or through E-mail packages such as cc:Mail or Microsoft Mail.)

Faxes can be sent directly from Windows applications (using File•Print) as well as from within WinFax Pro, and a phone book accessible to the whole workgroup can be stored on a shared network drive.

WinFax Pro for Networks runs as a TSR loaded on a *fax server* (a workstation with at least one fax-modem) and on each PC. Installation is a breeze, and hardware requirements are minimal on the server end. If your workstation is designated as a shared fax-modem, you can ensure that private faxes are sent directly to you alone.

You can also manage your fax flow by designating one or more fax-modems for the bulk of your faxing; a monitoring tool lets you see which fax-modems are currently available, in icon view.

Its ease of use and seamless connections make WinFax Pro for Networks a winning solution for workgroups that have a high faxing volume. **—Catherine Kenny**



SHARE A PHONE BOOK with co-workers in WinFax Pro for Networks. Faxes can be sent via fax, E-mail, or the net.

WinFax Pro 4.0 for Networks

Share fax-modems over a LAN.

Installation: Simple, but requires knowledge of the fax-modem's type and class.

List price: Starter Pack $399 (includes server and two clients)

Delrina

800/268-6082

Reader service no. 707

Bill Lawrence is part of a team that manages a 3000-node network for a major western utility. Jennifer Smith is a technical writer in Boston. Catherine Kenny and Harry McCracken are associate editors and Eric Bender is an executive editor for PC World *in Boston.*

For information about all these products, circle reader service no. 907.

5.3 Mbps* wireless bridge offers cost effective alternative to T1/E1 telephone lines

Altair VistaPoint®. A high performance wireless bridge that links LANs over a distance up to 3940 ft. (1.2 km) in the U.S. (2.1 km outside of the U.S.). A fully equipped system can typically be delivered within a week and installed in a few hours. There are no recurring monthly charges for leased telephone facilities or months of delay waiting for a radio license.

With Altair VistaPoint, you can link LANs on different floors, in different buildings or separated by barriers such as highways, railroads, or rivers.

The Altair VistaPoint is also an ideal solution for emergency backup and disaster recovery because it eliminates the possibility of a severed cable crippling your network. With additional hardware, your primary wired link can automatically switch over to the Altair wireless bridge to avoid loss of critical data when disaster occurs.

Based on Motorola's proven Altair® technology, the Altair VistaPoint delivers secure and interference–free communication over 18 GHz radio frequencies. Of course, the Altair VistaPoint is fully compliant with IEEE 802.3 and supports all your network operating systems and protocols.

Altair VistaPoint is quite simply the best way to make it seem like everybody's working under one roof. Call us at 1-800-233-0877 or 708-538-4800 to discover why the best connection for your LANs may be the one you can't see.

*The actual performance varies with protocols and packet sizes used in your network

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Circle 180 on reader service card

When We Say Server

s, We Mean Business.

Taking care of business. It's what you need in a server. And it's why your business should call ours.

For 10 years we've been packing power into some of the world's best portable PCs. Now we're doing the same for larger computers. Like the ones that run your workgroup, or even your whole company.

Fact is, we've made it our business to be one of the most connected computer companies in the world, and that's why we can offer a full range of reliable, fault-resistant servers.

INTRODUCING THE HIGH-PERFORMANCE Z-SERVER GT:

Up to four Pentium 90MHz CPUs

Upgradable to P6

Intel Multi Processor Specification 1.1-compliant

BALANCED I/O DESIGN

PCI and EISA bus slots

Dual Wide & Fast SCSI-2 disk controllers standard

Up to 1 GB ECC memory

RELIABLE

Hot removable hard disk drives

PCI RAID controller

Server management features

3-Yr. limited warranty

3-Yr. on-site service

Z-SERVERS are easy to install, maintain and upgrade. Plus, they're designed to work with everything in your environment, from computers to operating systems to applications.

But we don't stop there. We also deliver the dependable service and support you need. What's more, our remote management tools give you the power to monitor hardware, diagnose problems, set alarms and perform preventative maintenance from any PC on the network. You'll find we work well with budgets, too, which means you get all the performance users are asking for, at the price your accounting department demands.

intel inside pentium PROCESSOR

For more information and all the specs, give us a call today. Because once you put the power of Z-SERVERS at your side, hey, you're in business.

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Make The Connection™

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Circle 192 on reader service card

Work quietly

and carry a big network.

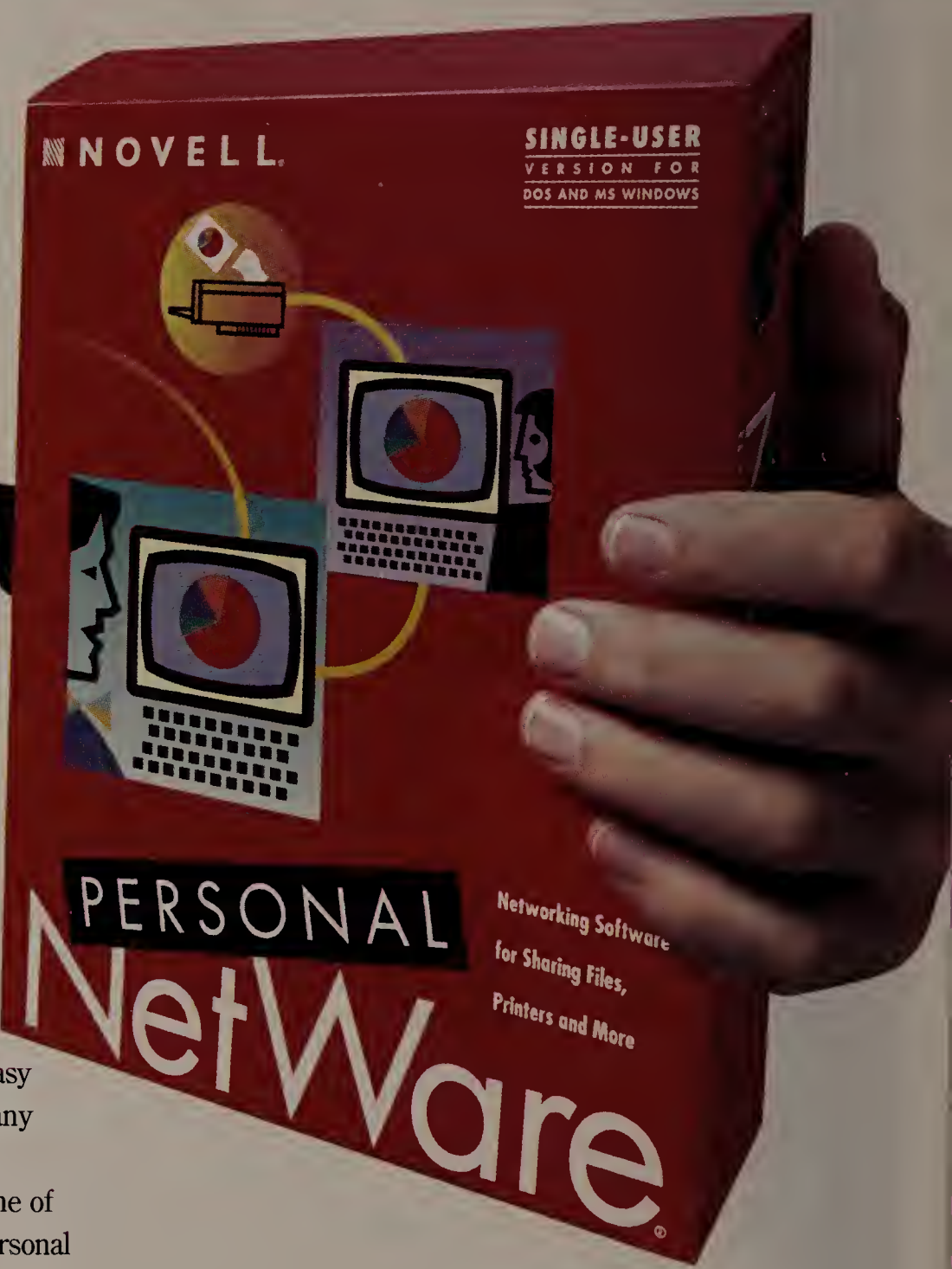
Personal NetWare. The big network for small business.

The leader in network computing has just taken the risk out of networking your business.

Personal NetWare® packs big features into an affordable, easy-to-use peer-to-peer network, with plenty of power for small businesses and workgroups. For starters, it works perfectly with what you already have. Whether you're using DOS or MS Windows, you can share files, printers, CD-ROMs and other resources with everyone on the network. Plus, an icon-driven, point and click interface makes setting up and using your network a breeze.

And Personal NetWare is a member of the Novell NetWare family—trusted by seven out of ten businesses, with over 40 million users worldwide. Personal NetWare offers full interconnectivity and an easy growth path to NetWare. Which means as your company grows, Personal NetWare will easily keep pace.

So get the small business network with the big name of Novell, the leader in network computing. Armed with Personal NetWare, you'll lead your company to growth and prosperity.



NOVELL®

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To get product information by fax, call 1-800-554-44
and request document #720.

The Past, Present, and Future of Network Computing.

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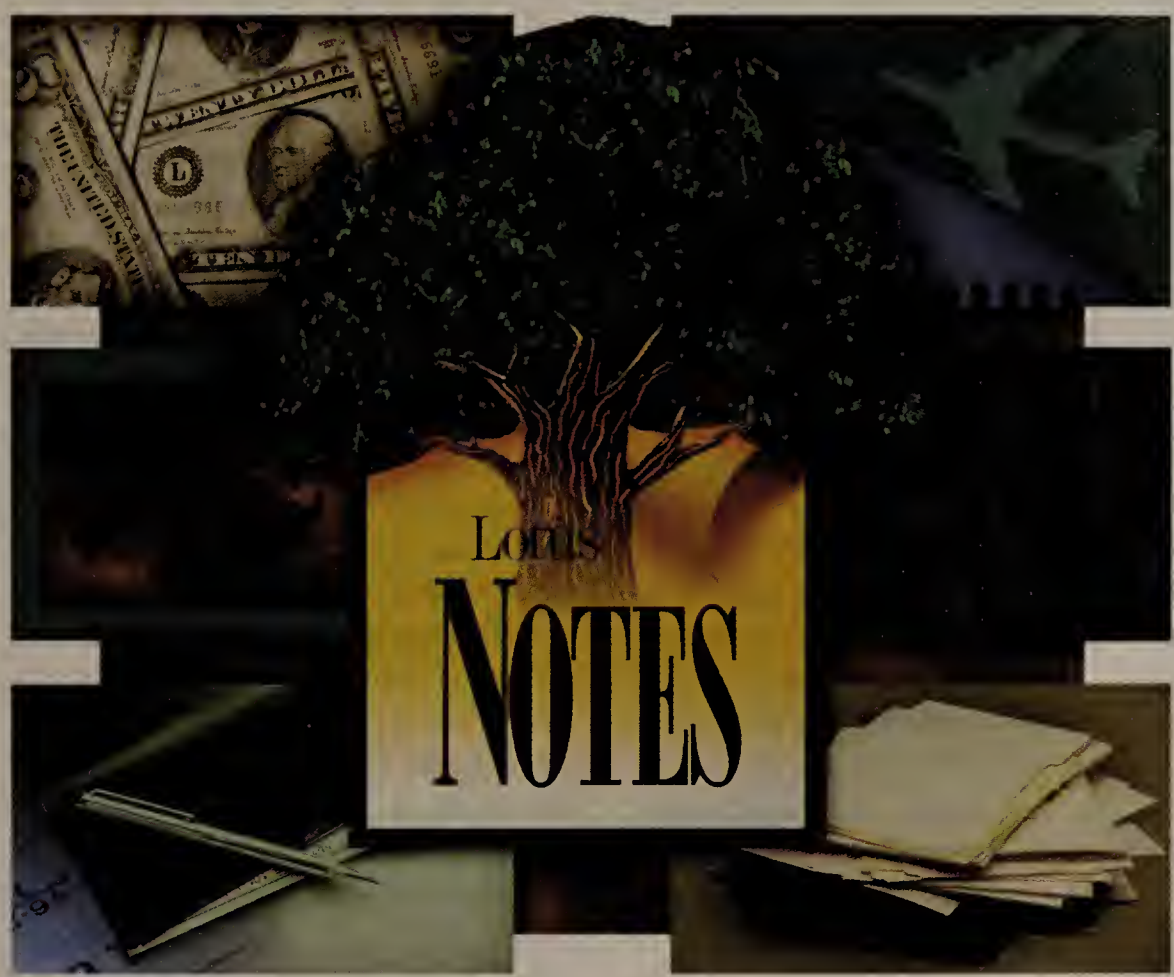
Delivering Applications With Lotus Notes

These off-the-shelf packages give a taste of what you can do with the leading workgroup application platform.

START INVESTIGATING WAYS TO SHARE information over the network with others in your department or your entire organization, and you'll start hearing a lot about Lotus Notes. That's not surprising, because Notes is the reference point for workgroup software. It has no current competition for giving employees access to up-to-date shared information of all kinds, from across the hallway or across the globe—no matter what type of computer or net they're on.

But start trying to figure out what Notes actually *does*, and things get slightly fuzzy. That's because Notes is not an application but rather a platform for building and delivering applications—and those applications can cover a bewildering range. Financial institutions use Notes to distribute investment information to customers, researchers rely on it for comprehensive data, help desks use it to respond quickly to customer requests, and sales groups find it useful for tracking prospects and customers.



Building on Document Databases

WHAT DO THESE APPLICATIONS LOOK LIKE? Notes apps are document databases. The documents are typically text-oriented—with a light veneer of graphics—although Notes can also deliver audio (and soon full-motion video). Different document forms are linked to each other; for example, a customer complaint form would be linked to a customer's company information form. You sort documents via *views* (for instance, by customer name or type of complaint). Document sharing and E-mail are built in. Developers add work-flow capabilities and a host of other features through the Notes macro language or programming interface.

By Peter Loshin

For creating applications, your options range from buying a shrink-wrapped package that requires minimal customization to building your own application from scratch. Complex Notes applications can be rolled out in a fraction of the time needed for traditional net packages. The infrastructure can support a wealth of applications, and Notes works well in concert with conventional desktop and net applications.

But none of this is free. Notes requires a significant investment of time, money, and effort—initially as well as over time. You'll need a dedicated Notes server, workstation upgrades, and up to $495 (list) per user for the Notes package itself—and this is before you spend a penny on training, applications, or development. You'll have to judge these costs against the potential benefits: for example, holding onto a key customer by solving a problem quickly, or landing a contract through a proposal your group otherwise would not have had time to create.

Lotus also offers Notes Express, a $100 client version that works only with five built-in applications. However, we advise against buying this crippled version.

Here's a look at a few full-blown Notes applications.

Sampling the Bundled Miniapps

LOTUS BUNDLES SAMPLE APPLICATIONS AND *templates* (application "skeletons" containing no data) with Notes, much the way Microsoft bundles accessories with Windows. These tools work but generally are not full-featured applications, although they get more polished with each release.

Among these applications is a purchasing system that automates the buying process,

handling everything from browsing a database of items approved for purchase to composing purchase requisitions and routing them for approval to tracking the fulfillment process. Other sample packages include a travel authorization system, a contract library, and a news database for disseminating information. The templates keep track of mailing addresses, facility reservations, document libraries, meeting schedules, news listings, to-do lists, and more.

If you buy the Notes Suite (which adds Lotus's SmartSuite desktop packages), you also get 18 more Notes applications, ranging from a group contact manager to the Competitive Monitor, which draws on massive databases of business information.

To create a new database with sample Notes applications, you simply drop down the *File* menu, select *New Database*, type in a name, and choose the appropriate template. (If you're uncertain of which template you'd like to use, you can select one and click the *About...* button to read a help file telling you how it works.) Open the database, and an information window explains how the database operates and offers tips for modifying and administering it. To make this application work for your organization, however, you have to customize it, as well as handle administrative tasks such as assigning user rights.

The Notes infrastructure easily supports a wealth of applications, and Notes works well in concert with both conventional desktop and network packages.

Sharing Your Documents

LOTUS INCLUDES THE NOTES DOCUMENT Sharing Application with Ami Pro 3.1. This application provides a document tracking and management database for workgroups that use Ami Pro 3.1 or other applications that support Notes/FX 1.1, a Notes integration technology based on OLE (Object Linking and Embedding).

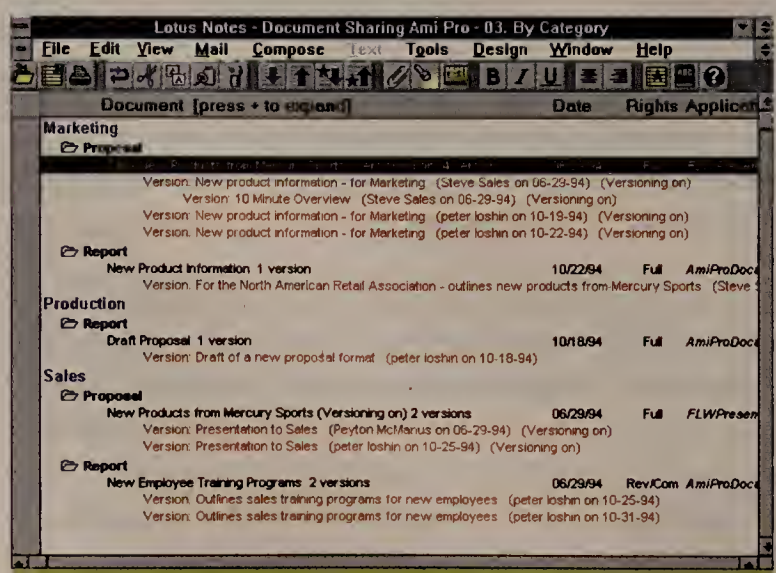
The Document Sharing Application provides a framework for collaborating on documents. One user can create a document and then grant review, comment, and full edit rights to other members of the group. When the next user opens the document, it comes up ready for editing in the original application. If you use Ami Pro, you get an added palette with a few workgroup-oriented tools for tasks such as attaching notes or an editor's summary remark. You can choose to preserve the original document by saving subsequent edits in new versions, which all members of the group can see.

All document files are stored centrally through Notes rather than on an inaccessible hodgepodge of floppy disks and individual desktops or portables. You can ask the system to automatically notify the original author—or everyone in a designated workgroup—when a document is modified, and you can click on the message to bring up the document.

Setting up this application calls for a certain amount of Notes savvy in assigning group and individual access levels and modifying or creating Notes document templates. Application documents are nested inside Notes documents. so you must first modify the New Document Template form for each type of document you want to track. While you're still in the Notes form, open the application (for example, Ami Pro) and create a template (for example, an Ami Pro style sheet). When you're finished, save the template from within the application, go back to Notes and insert the template into the Notes form, then save that document in Notes.

This layered approach is confusing at first; the interface isn't as polished as that of a dedicated document manager such as WordPerfect's SoftSolutions. And if you simply want to view a file, performance may lag since you must load an entire application rather than just a file viewer.

You wouldn't buy Notes simply to install this application. However, the power of this approach to document management slowly creeps up on you. A bonus you'll notice over time is the way you are automatically notified of document changes—a feature typical document managers don't offer. And it's fairly easy for someone with a bit of programming flair to add document routing or more complex work-flow routines.



THE DOCUMENT SHARING package that comes with Ami Pro 3.1 manages documents created by Ami and other packages supporting the Notes/FX integration technology.

Providing Customer Service

LOTUS BUNDLES CSERV, AN INTEGRATED customer service application, in Notes release 3.1.5 and later versions. CSERV comes with sample data for a fictitious publishing firm, although it can be used for any type of company. It's another app that works well out of the box but will need to be modified slightly for your organization.

CSERV includes five linked databases plus a separate online help database. A Call Tracking module lets support personnel quickly gather appropriate information about a problem and then view either all open calls or calls by category; it also assembles call resolution statistics for managers. This module's call reports can generate documents for the other databases, which include Customer Suggestions to record customer inputs, Product Design Problems for reports of product flaws, and a Knowledge Base that acts as a repository for how-to information. The fifth database is a design aid for customizing the application.

Like traditional customer service applications, CSERV is designed to handle problems quickly without letting anything slip through the cracks. Unlike conventional packages, however, CSERV takes advantage of one of Notes' most dramatic benefits—the ability to set up links across organizations. If you have sufficiently close ties to a customer who has Notes, you can give the

A WORKING PERSPECTIVE:

Information Management Lands on the Desktop

Advances in technology turn information overload into accessible and usable knowledge.

Each person in today's workplace increasingly is called upon to be the master of his or her own information universe. The need to access the latest data quickly and intelligently now grows as fast as an individual's list of responsibilities. More and more corporate landscapes have flattened, resulting in decentralized business processes, higher productivity standards, depleted administrative support, and critical decision-making trickling down through the ranks. These developments have in turn created knowledge workers: a growing class of professionals responsible for calling the shots and requiring timely and relevant information on which they can act immediately.

Absorbing More Knowledge

To meet these progressive demands, technology is capable of offering new and intelligent information management solutions. In essence, knowledge workers are forced to absorb and use more information from a wide range of sources. Local and wide area networks, scanned magazine and newspaper articles, hard disks, the Internet and other public online services, faxes, E-mail messages: Each of these sources can contain make-or-break data for the knowledge worker.

With fewer people performing more high-priority functions, having access to the information from these sources is not just a boon in today's workplace, it is an expectation. But it is possible to synthesize text and original image information from all these sources, creating a single and powerful base of information, and saving both hours and effort while allowing better decisions to be made.

Advances in Information Management Software

- **Intelligent software reads and remembers word processing files, spreadsheets, faxes, E-mail, online documents, and scanned paper documents**
- **Access and usability from within other popular applications**
- **Data intelligently and automatically analyzed, understood, and indexed without manual keywording**
- **Searches accomplished through words related to needed document**
- **Search results returned in order of relevance to query**

The Reality of Intelligent Assistance

Steve Humphreys, President, Caere Corp.

Viewpoint: Steve Humphreys, President, Caere Corporation

With the way the business world has developed in the last few years, we have little choice about information. There are simply fewer people responsible for more bottom-line functions in today's companies. We need data from numerous sources to perform those functions, and as individuals, we have to be able to manage the data quickly and accurately. And I don't think this is a trend that's going to slow down anytime soon.

But there is an upside that I'm not sure enough people are aware of. And the upside is that technology has advanced right along with the increasing demands and pressures in the business environment today. All the information we need, and I don't mean simply text but original images as well, can be kept in one place.

Technology can arrange it and deliver it back to us in a process that's basically as logical and comfortable as our own thought process. The idea of an intelligent agent isn't just an idea anymore, it's here. And we allow the data to be easily shared to get wherever it needs to go. There really are solutions to information overload in the electronic age, and we've got them.

• • • • •

If you have questions or comments for Steve, you can catch him on the Internet at asksteve@caere.com. Or contact Caere on our America Online or CompuServe forums.

Access Made Smart and Simple

But beyond and possibly above the base of information itself is the need for the knowledge worker to be able to act on it quickly and easily. A pile of faxes, overstuffed file cabinets, disks in the drawer, and scattered databases do not streamline productivity.

Today's unique technological advances offer software that not only reads but automatically indexes an entire database of text and images to allow for quick, intuitive searches. Without the time and drudgery of keywording or manual entry, the ability to profile documents based on word frequency and sentence structure makes intelligent search and retrieval by informal query a reality.

Intelligent technology is now available to allow searches that are activated as naturally as human recall. Even further, the results of free-form searches can automatically be displayed in order of relevance and color-coded by degrees of priority. Retrieved documents can even be used as the "agent" of a subsequent search to track down similar documents and clearly identify the links between them.

Todd Hochrad, Area Sales Manager, CEM Corporation

Mobile Access Breeds Success

As an area sales manager for CEM Corporation, a maker of analytical laboratory instrumentation, Todd Hochrad needs just the right data in a snap to close a sale. His clients, scientists and industrial chemists, want facts and figures, not the big schmooze.

Hochrad used to lug around his laptop, product catalogs, and a bundle of scientific journals to make his point. In Hochrad's home office, a client request for a journal article frequently used to mean sorting through the stacks, pulling pages out for the copier, mailing the article, and often a cooled-down sales lead by the time the information arrived.

An Austin DX 400 notebook, loaded with PageKeeper, now carries everything Hochrad needs. Not just the data, but the actual images of articles, testimonials, and price lists are right in his hands all the time. At home, he can instantly respond to client requests by fax-modem, searching and sending without ever leaving PageKeeper. And not only is PageKeeper now used in CEM's service and international departments, but Hochrad just got promoted to director of CEM's Far East region.

Sharing the Wealth

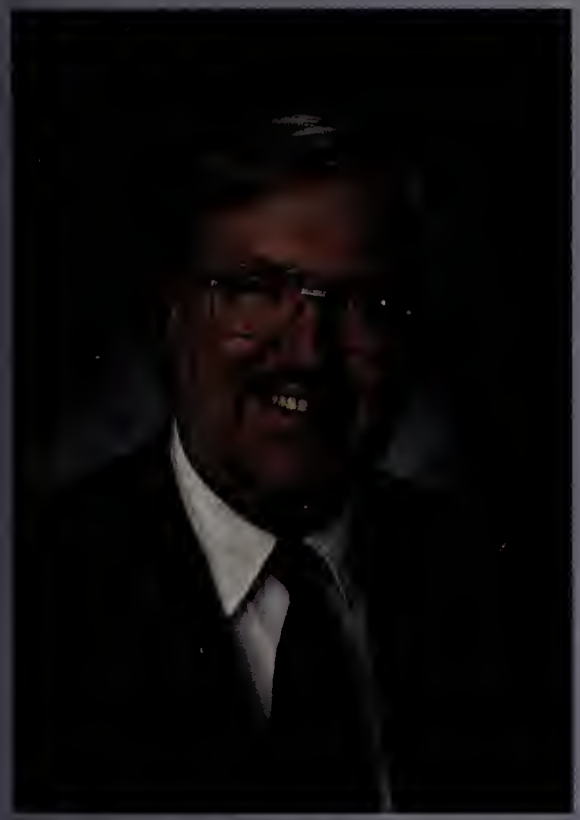
With the increased responsibility of the knowledge worker for independent data control, often comes increased responsibility for sharing information with more parties. Mobile professionals on the road, department members, and networked groups all need to relay information to clients, colleagues, or corporations. By leveraging existing means of communication, intelligent software can use and tap into E-mail, fax programs, and even the Internet to share information. The knowledge worker now has a fluid means of keeping others as informed as possible.

The Solution, Simply Put

The intelligent, easy-to-use solution to the progressive demands placed upon the knowledge worker in today's business world is called PageKeeper, a document management program developed by Caere Corp. PageKeeper promotes the acceptance and synthesis of information from multiple platforms, automatically indexes in a logical fashion, makes the intelligent search and retrieval of information fast, fluid, and flexible, and allows efficient internal and external sharing of Caere's latest technological advances.

Utilizing Natural Language Processing and its own Weighted Relevance Retrieval and Similar Document Search features, PageKeeper is the first comprehensive document management program to enable individual desktop and mobile users, as well as workgroups, to manage and retrieve information from virtually any source. It requires a minimum of an IBM-compatible 386 or above, 8MB of RAM, and Windows 3.1 or later.

Scanning for Justice



Robert McCullough, McCullough Research

As an international research consultant to the energy industry, Robert McCullough's business is strategic planning and litigation support for public utilities, independent power companies, government agencies, and others. From planning studies and federal laws to contracts and financial documents, he is responsible for instant access to data that could otherwise be buried in a mountain of paper.

"We found that one project could easily take up six feet of shelf space, involving thousands of sheets of paper," says McCullough. But every sheet of paper that enters the offices of McCullough Research in Portland, Oregon, where a scanner sits on each of the six employees' desks, is scanned into PageKeeper. In McCullough's office, PageKeeper resides on several SCSI drives connected to a series of Compaq 486 desktop computers on a local area network. Labeled by specific subject, major project, or even by query, all that data is at his fingertips via PageKeeper.

PageKeeper has even helped McCullough outshine his opponents in the courtroom. During a Public Utilities Commission hearing in New York, McCullough and his laptop armed with PageKeeper instantly printed a vital exhibit while eight opposing attorneys (backed by two trolleys full of reference files) watched in awe.

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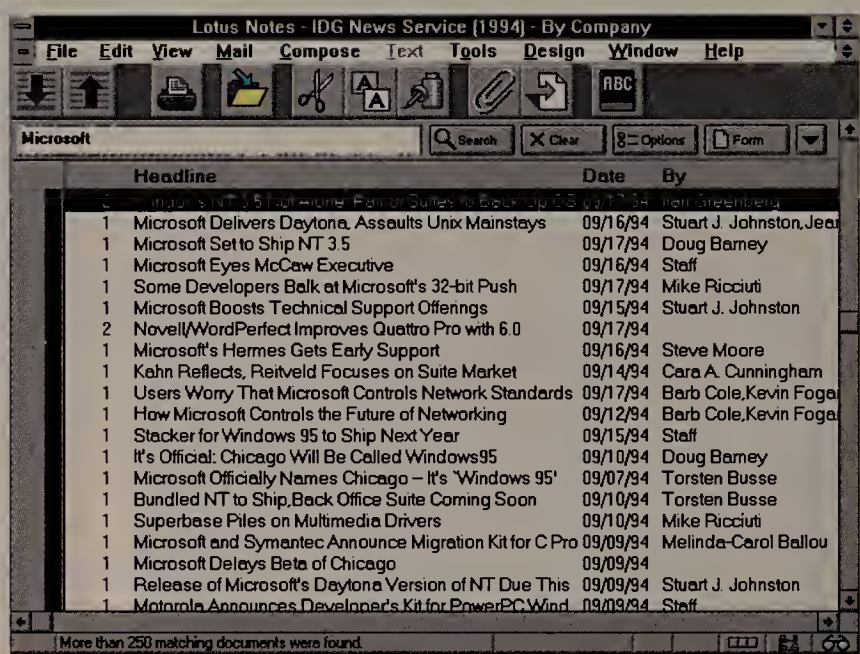
customer access to the application itself. That way, an authorized customer could originate a document for the Customer Suggestions database—a more efficient method for both parties. CSERV also includes amenities such as the ability to churn out form letters acknowledging customer problems.

LOTUS POSITIONS ITS BUNDLED CUSTOMER SERVICE APPLICATION as a full-blown package ready for action after only slight modification.



NOTES OFFERS A HANDY MECHANISM for delivering, filtering, and searching online news, as in this in-house service run by International Data Group.

Help for In-House Services

IF YOU NEED SOMETHING tailored to your company's computer support help desk but don't have the time or inclination to do it yourself, consider Help, from Groupware Incorporated. The package costs $2500 per Notes server; this includes 5 hours of consulting time, which should cover basic tweaks such as customizing screen displays.

In Help, service personnel take inbound calls and record them in trouble tickets, which are then forwarded to tech support. This form describes the problem being reported, with fields for the caller's name and phone and information about the caller's computer system. Among its benefits, the package can automatically send an E-mail message to a supervisor when tech support takes too long to solve a problem, and customers with access to Notes can create trouble tickets or check progress on their complaints with a telephone call (via Lotus's optional Phone Notes software).

Groupware Incorporated considers itself less a software vendor than a Notes consulting company. Most customers start by trying the basic product and then submitting a list of changes, such as special forms for returning equipment, or links to existing help desk databases. Most sites require somewhere between 5 and 50 hours of consulting time; Groupware suggests a custom-built application if more work is needed.

Out-of-the-Box Work Flow

QUALITY DECISION MANAGEMENT'S Quality at Work (QAW) Business Utilities package runs virtually out of the box, requiring little or no modification. QAW adds a collection of five function-specific forms that are based on Notes Mail and correspond to five common work functions: Action Items, Request Approval, Dialog, Brainstorm, and Opinion Poll. The software sells for $5000 per server.

QAW's Action Item form, for example, lets a service "customer" and "provider" negotiate a customer request and carry it through to completion, tracking the nature of the request, the expected dates of completion, and customer satisfaction. The Request Approval form handles requests for approval, either serially (up a hierarchy) or in parallel (within a group of peers). In serial mode, any negative response returns the request to the sender, and people up the ladder never see it.

The Business Utilities work with QAW Customer (a customer management system), QAW Project (a project management application that can be linked with Microsoft Project), or any other Notes application. Someone with programming skills can add fields or logos to forms, or change form names or keywords. Sample changes are included for chores such as modifying the extent to which Action Items may be reassigned.

Delivering the News

NOTES ALSO OFFERS A HANDY way to deliver online news from various services. You simply choose the types of news stories you want, decide who in your organization should get news and how often it should be updated, ask your Notes administrator to install the news database and set up connections with the provider—and that's about all there is to it.

Incoming news stories are then filtered through Notes views (for example, according to company name), and you can find information using Notes' full-text searches. That's just one more way in which Notes brings information to anybody who needs it—anywhere in your organization.

Peter Loshin is a freelance writer and networking expert based in the Boston area.

Help
Groupware Inc.
800/638-2666, 503/294-1194
Reader service no. 700

Lotus Notes
Lotus Development Corp.
800/346-1305, 617/577-8500
Reader service no. 701

Quality at Work Business Utilities
Quality Decision Management Inc.
508/688-8266, 508/688-5181 (fax)
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For more information about all these products, circle reader service no. 906.

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Here's How

Contents: Spreadsheets 250 | Word Processing 254 | Windows 262

HELP LINE Q & A

Tip of the Month

QUICK SYSTEM CONFIGURATION INFORMATION: Microsoft System Info is a system configuration utility built into such Microsoft applications as Word 6.0 for Windows, Excel 5.0, Publisher 4.0, and Access 2.0.

You can launch System Info from within one of those programs by selecting Help • About and pressing the System Info button or, from Program Manager or File Manager, by selecting File • Run, typing \WINDOWS\MSAPPS\MSINFO\MSINFO in the Command Line text box, and clicking OK.

MSINFO divides information about your system into categories including System, Printing, Fonts, Proofing, Graphic Filters, Text Converters, Display, Applications Currently Running, and Registered OLEs. Select a category from the Choose a Category drop-down list; after you've read the information, you can print the details or save them to a file for later use. MSINFO comes preconfigured for quick access to Control Panel, File Manager, NotePad, Write, and the System Configuration Editor (SYSEDIT.EXE). Just select Run and double-click the applet's name. You can also launch applications: Select Other and enter the application's name.

Steve Bass, Contributing Editor

Expensive SIMMs

Q I'm in the market for some SIMMs [single in-line memory modules] for my Gateway 2000 computer, and I've noticed that the advertised prices for RAM in the back of most magazines are a lot lower than Gateway's. For example, a 72-pin, 70ns 4MB SIMM from Gateway is currently $200, but if I were to buy it from another company I could get it for $150. A Gateway technician told me that his company's memory is better because it has parity and the pins are gold plated. Is there anything in particular I should look for when I buy memory? Do name brands really count?
Thomas Abbate, Montvale, New Jersey

A Gateway's technician is handing you a line. SIMMs are commodity items; you can get SIMMs with gold-plated edges (though that's not really necessary) and parity from any number of vendors. What's more, because Gateway probably keeps a limited inventory of SIMMs and needs them to produce computers, memory is bound to be cheaper if you order it from someone else. As long as the number of pins, the number of chips on the SIMM, and the access time are the same and the memory has parity, you won't notice any difference between brands.

Floppy Shuffle

Q How can I read a file from one floppy disk, edit that file, and save it to another floppy? I use 3½-inch disks for all my data files, including a disk of blank templates for letters (I never save data to my hard disk). I run Windows 3.1 with WordPerfect, Word, and many of the usual applications. In the past, I was able to launch WordPerfect, read in the template file I needed, insert a new 3½-inch disk, write my letter, and save the edited file to the new disk. But ever since I installed Microsoft Office, a message comes up that does not allow me to save to the new disk. What's going on? How can I keep the app from checking which floppy is in the drive?
Gerald Dittberner, Internet

A Replacing a floppy disk when a file from it is currently open is a recipe for disaster. Unlike the Macintosh operating system, DOS doesn't have a way for you to specify a floppy disk when you name a file. In fact, it handles media switches rather badly—replacing a disk while one of its files is still open can lead to overwritten files, lost data, cross-linked directories, trashed File Allocation Tables, and other nasty situations. This is why VSHARE.386, a Windows device driver that was added to your system when you installed Office, stops you from swapping disks behind DOS's back (so to speak) by checking the Volume Serial Number of each disk.

Two floppy drives are truly a necessity if you intend to keep all of your data on floppies, so don't skimp and try to get by with only one—after all, they only cost about $70, even at full retail. With two drives, you can use the File•Save as command in your application to save files to another floppy.

If you need to make do with one floppy drive on a temporary basis, there is a work-around, but it's a little more complicated. First, copy the floppy with the template files to a new floppy using DOS's **DISKCOPY** command; then delete the templates you won't be using from

DOUG ROSS

the new disk. You'll now have a floppy with the right template and with plenty of room for your data files.

Faster Floppies

Q My wife complains that the 1.44MB floppy disk drive on our home computer works much more slowly than hers at work. Our home system is a 66-MHz 486DX2, and I use a cache on both floppies. I also use Windows for Workgroups and all of its caching. Hard disk performance is wonderful, but why is the speed of the floppy drive at home so much slower?
Martin Block, San Ramon, California

A Your problem is most likely due to Windows for Workgroups' 32-bit File Access feature. When this feature is enabled, Windows for Workgroups caches your hard drive but not your floppy disks. Thus, unless you keep SmartDrive installed, your floppy disks will actually slow down. What's more, according to Microsoft's technical notes, the 32-bit File Access feature reduces SmartDrive's memory to only 128K, leaving very little memory to cache floppies and CD-ROMs.

Windows for Workgroups' 32-bit File Access feature is incompatible with many DOS device drivers, utility programs, and existing batch files. Therefore, I recommend that you turn this feature off and use a DOS-based disk cache (such as SmartDrive or Norton's NCACHE) instead. Both will cache floppy drives and do an excellent job on your hard drive as well.

A True Home Computer

Q I want to install a device to let my 486-based PC monitor my home power consumption. Can I connect a clip-on ammeter to a data acquisition board and read my daily electricity use?
Rama Sattiraju, East Brunswick, New Jersey

A Remote Measurement Systems in Seattle, Washington, makes a line of data acquisition products, one of which, the Power Sentry, can help you monitor the amount of current your home is using. It attaches to your electric meter and watches the little wheel (called an "eddy wheel") inside as it turns. The Power Sentry sends a pulse to your computer each time the black stripe on the wheel comes around, letting your computer know that the house has consumed more power.

However, this device can only monitor the power consumption of your entire house—unlike an ammeter, which can be attached to individual appliances. But because it hooks up to your electric meter, it will give you exactly the same data the power company uses to create your monthly bill.

- **Remote Measurement Systems;** 206/328-2255
  Reader service no. 731

Vanishing Video

Q It appears that Video-7 has gone out of business, and I can't get my 1MB Video-7 graphics card to run Windows in anything other than VGA mode. Can you tell me where I might find the most current drivers?
Washi, America Online

A Video-7 is no longer in business, but the Video-7 name has been acquired by a German company called SPEA Software, which is said to be introducing new video cards under the Video-7 name. SPEA Software can be reached at 011-94-8151-266-0. The fax number is 011-8151-212-58, and the company has a BBS at 011-94-8151-266-241. You can write them at SPEA Software AG, Moossre, 18b, D-8130 Starnberg D-82319, Germany.

I can't guarantee you much success in finding new video drivers, but this company is the place to start.

Classified Information

Q We have a removable hard drive cartridge containing a Western Digital Caviar 280 disk drive used for storing programs and classified information. The problem is that we cannot access

USER GROUP OF THE MONTH

Richmond PC User's Group

January's user group tips come from the Richmond PC User's Group in Richmond, Virginia. RPCUG's meetings are open to the public and held on the fourth Tuesday of each month at the Science Museum of Virginia Auditorium, located at 2500 West Broad Street. The club publishes the monthly *Virginia PC Newsletter,* which features DOS and Windows tips; meeting topics and highlights; software, hardware, and book reviews; and special offers. It also supports 15 special interest groups (SIGs) for members, including those for spreadsheets, word processors, databases, BBSes, CD-ROMs, Windows, OS/2, and shareware. RPCUG maintains a library of more than 500 shareware and public domain programs, which is available to members at the monthly meeting. The group also sponsors the Richmond PC Rehab Lab to refurbish donated computer equipment for schools and other worthwhile organizations.

For more information about the Richmond PC User's Group, contact Steve Meredith, president, at P.O. Box 17068, Richmond, VA 23226, or call 804/355-7911. General meetings are free, and membership costs $20 per year for a family of one to four individuals.

Reader service no. 732

FILE MANAGER WINDOW LAYOUT: In Windows 3.1's File Manager, select Windows • Tile, and your directory windows will display above and below each other. For a side-by-side layout, hold down <Shift> and select Windows • Tile.

Margo Neal
Richmond PC User's Group

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the drive. The computer, as well as multiple utility programs, says no drive exists. When the computer is turned on, we see the message 'C: drive failure'. We have checked the integrity of the cable, connectors, and computer by swapping parts; it appears that the drive is the faulty component.

The drive is under warranty. However, I must run Norton's WIPEDISK at its "military" level to clear off the classified data before I can ship the drive back for repair. But when I try this, I get an error message and cannot wipe the data. Thus, I'm stuck with a drive that will not allow access, and I cannot send it anywhere for repair because it contains classified information. Can you help?

Patrick M. Jerding, U.S. Air Force, Langley Air Force Base, Virginia

A Most of the time, when a hard drive fails, the problem is not the media or the motor; it's a chip failure on the circuit board attached to the drive. In your case, this is good news, because it means you may not need to wipe the media to fix the problem. Instead of exchanging the entire drive, check with suppliers to see if you can exchange just the circuit board (which contains no classified information) and have a technician at your site install the new one. Another option is to wipe the data from your other, working drive, then swap the circuit boards and return the wiped drive for repair. (This may void your warranty, but at least the drive will not be a total loss.) If swapping circuit boards does not bring the broken drive back to life, you'll need to destroy it to avoid compromising the classified data.

Doomed to Too Little Memory

Q I attempted to install the shareware game Doom on my Tandy Sensation. The installation went just fine, until I got to the sound card information. I was unsure of the settings, so I just told the program to use the PC's internal speaker. When the installation was done, I got the message 'Insufficient DPMI memory'. I tried to install it again, specifying Sound Blaster as the sound card, and got the same message. I had run both MemMaker and Defrag before doing the installation.

What, exactly, is DPMI memory? Why don't I have enough?

Lynn Beck, Brooklyn, New York

A The problems you're experiencing have nothing to do with the sound card settings. Doom, a graphical shoot-'em-up game, needs lots of memory to work; therefore, it was written using a special programmer's tool called a DOS extender. The DOS extender, in turn, uses a convention called DPMI (DOS Protected Mode Interface) to let Doom run in protected mode.

In my experience, Doom takes so much memory that in order to get it to run on a 4MB machine, you will need to boot the system without resident software such as disk caches. (If you have DOS 6 or a later version, you can create a special configuration for Doom that loads no TSRs and starts the game right away.) If you have 8MB or more of memory, you can probably run Doom from the DOS prompt without removing any TSRs.

Why a /Y?

Q When reading your September *Help Line* column, I was a bit nonplussed by your reply to J. P. Rabbitt ("Y Not"), who wanted to know how to delete all the files in a directory without being prompted for a 'Y' or 'N'. To be tactful, it was less than a perfect answer. It had two shortcomings: First, it works only with DOS 6.0 or a later version; second, it requires the user to re-create the deleted directory each time.

Here's a way to make it work for all versions of DOS. Change the line to read **ECHO Y|DEL** *path**.* and the batch file will automatically supply a 'Y' to the DEL command. The directory will remain intact as well.

Dan Shackelford, Fullerton, California

A Several readers have written similar letters, asking why I did not mention the technique you describe. Although I was aware of that option, I advised Mr. Rabbitt to use the more powerful DELTREE /Y command because DEL also has serious shortcomings. The DEL command cannot delete hidden, system, or read-only files; it leaves such files in the directory. If the aim of the batch file is to delete the files in the directory and then remove the directory itself, the RD command will fail, because there will still be files in the directory. A similar problem occurs if the directory contains subdirectories; the subdirectories can't be removed, and so the RD command can't remove the parent directory. In contrast, DELTREE removes *everything*—hidden, system, and read-only files, all subdirectories and their files, and the parent directory itself.

Re-creating the directory is not a significant problem, since it's easy to follow the DELTREE command with an MD command on the next line of your batch file.

It's true that DELTREE is not present in versions of DOS prior to 6.0. However, now that DOS 6.*x* is more than a year old, and upgrades are inexpensive, it rarely (if ever) makes sense to continue to use an earlier, obsolete version. But if you must run an earlier version of DOS, there are several third-party utilities (most sporting somewhat violent names like NUKE and KILL) that will perform the same function as DELTREE on any version of DOS; check your favorite BBS for one.

By Brett Glass

Brett Glass is a contributing editor for PC World. Help Line *welcomes your questions (see page 12 for contact information).*

POWER TIP no. 313

Looking Out for DELTREE Prompts

Make sure that DOS 6.x's DELTREE command prompts you to confirm that you want to delete a directory. If it doesn't, you may have misspelled the directory name, in which case DELTREE will neither delete the directory nor display an error message.

Ken Johnson
Oak Park, Illinois

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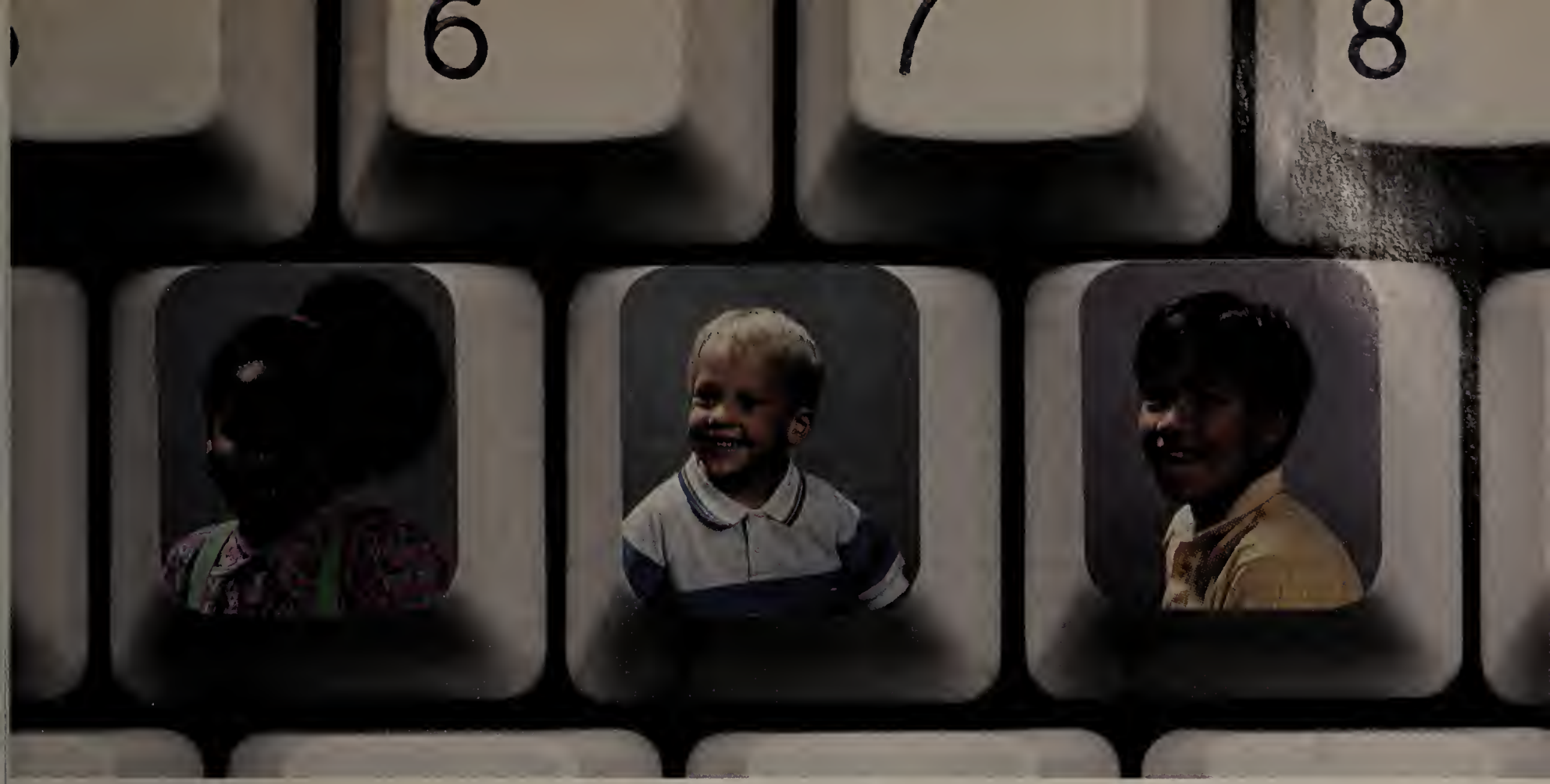

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SPREADSHEETS Q & A

Weighted Averages in Any Spreadsheet

Q I'm a teacher, and I use Lotus 1-2-3 for DOS to record my students' marks and compute their averages on a series of weighted quizzes. I need to exclude a missed quiz from the average when the student has been excused. Short of creating a separate formula for each student, a macro is the only way I can think of to solve this problem.

D. Schreiber,
Scarborough, Ontario, Canada

A You don't need a macro, but in 1-2-3 you'll need a set of intermediate formulas to calculate the averages. In Excel or Quattro Pro 5.0 for Windows, you can do this with an array formula.

FIGURE 1 illustrates the solution. The student names are in column A, the quiz data in columns B through D. The maximum score for each quiz is shown in B2..D2; the students' scores are shown in B3..D5. Both Bell and Bender missed Quiz1; Bell had an excuse, so his cell is blank, but Bender had none, so her score is zero.

The solution (for any DOS or Windows version of 1-2-3) requires a set of intermediate formulas, located in F3..H5. The formula in F3, **(@CELL("type", B3..B3)<>"b")*B$2**, yields the number of points that each student is responsible for on each quiz. The formula is designed to deal with a blank cell indicating that a student has been excused. If cell B3 is blank, the @CELL function returns "b", so the logical formula (@CELL("type",B3..B3) <>"b") is false, and multiplying by B2 yields zero, meaning that the student is not responsible for points on that quiz. Once the formula is copied into F3..H5, calculating the percentages in column E is easy. The formula in cell E3 is **+@SUM(B3..D3)/@SUM(F3..H3)**; that is, the sum of Bell's scores divided by the sum of the points he's accountable for.

In Excel, you can skip the intermediate formulas in F3..H5 and compute the averages with array formulas like this one for Bell in cell E3: **=SUM(B3:D3)/SUM(NOT(ISBLANK(B3:D3))*$B$2:$D$2)**. (Press **<Ctrl>-<Shift>-<Enter>** to enter this formula as an array in cell E3.) The formula checks each cell in B3:D3 to see if it's blank, then multiplies the resulting True or False values by the corresponding weights in B2:D2. A SUM function adds up the results, and then a percentage is calculated.

Like Excel, Quattro Pro 5.0 for Windows includes arrays, but because it lacks Excel's ISBLANK function, you must enter a code to mark the excused quizzes. I entered an X (for excused) in cell B3. Then the formula to compute the average for Bell is **@ARRAY(@SUM(B3..D3)/@SUM((B3..D3<>"X")*$A:$B$2..$D$2))**.

In both Quattro Pro and Excel, you can just copy the formula to calculate the averages for the other students.

F3 @ (@CELL("type",B3..B3)<>"b")*B$2

	A	B	C	D	E	F	G	H
1		Quiz1	Quiz2	Quiz3	Percent	Quiz Weights		
2	Name	10	5	20	100%	Quiz1	Quiz2	Quiz3
3	Bell		3	14	68%	0	5	20
4	Bench	4	4	18	74%	10	5	20
5	Bender	0	6	15	60%	10	5	20
6								

FIGURE 1: CALCULATE ACCURATE AVERAGES on weighted quizzes—even for a student with an excused absence (B3) that's not counted.

Controlling Graph Font Size in Quattro Pro for Windows

Q I've set up a series of graphs in Quattro Pro 5.0 for Windows to use in my master's thesis. I have strict style guidelines that include using a consistent typeface and point size for thesis text and graph text. I created a Quattro Pro graph and specified Times New Roman 12 point for all the text, but when I printed it in landscape, the text was much bigger. How do I get the correct font size in the printed graphs?

Ken Blount,
University, Mississippi

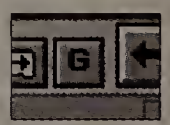
USER GROUP TIP

Get a Handle on Excel Quick Fills

If you're in Microsoft Excel 5.0 and want to fill one column with repeating data down to the same row as an adjacent column, highlight the source cell and double-click its handle. Excel will fill down to the cells in the adjacent column.

Steve Meredith
Richmond PC User's Group

A You've run afoul of Quattro's predilection for on-screen slide shows, but that's easy to fix. Create the graph, then enter the graph window to print it: If your graph floats on the worksheet grid, double-click it to enter the graph window; if it's on the workbook's graph page, click the Graph Page button shown at right to go to the graph page, then double-click the icon for the graph.



In the graph window, click the Select All button shown below, then select *Property•Current Object•Text Font.*

Choose *Times New Roman* as the typeface, *12* as the point size, and click *OK*. Select *Property•Graph Window•Aspect Ratio.* You'll find Screen Slide selected; this makes your graph appear in the window as it would in a screen slide show. Click *Printer Preview* instead, then click *OK*. This selection tells Quattro Pro to display your graph in the graph window as it appears in Printer Preview, and it also causes Quattro to use the typeface you selected when it prints the graph. Now select *File•Print* to print the graph.

Pesky Fixed Decimals in Excel...

Q I just installed Excel 4.0 on my new notebook PC, and it insists on changing the numbers that I enter: 2

appears as .02, 400 appears as 4, and so forth. What's going on here?
Michael Grealy, Mexico City

A You've got fixed decimals turned on: Select *Options•Workspace* (in release 5.0 it's *Tools•Options•Edit*) and deselect *Fixed Decimal.*

...And Fixed Decimals Macro Revisited

Q In your response to Ken Elder's question in the August issue about turning Excel 5.0's fixed decimals on and off ("Fixed Decimals (and More) in Excel"), you used a seven-line Visual Basic macro. I've come up with a more efficient version that eschews the If–End If structure:

```
Sub AutoDecimals()
 With Application
      .FixedDecimal = Not .FixedDecimal
 End With
 End Sub
```

Rocco Antonelli, Rockville, Maryland

A Hear, hear! You've not only built a better macro, you've neatly spotlighted the beneficial change in thinking that comes with an object-based programming system like Visual Basic. My original macro reflects the deep mental grooves worn by years of conventional step-by-step programming.

Your version uses the insight that Excel's decimal function has the value True or False at a given moment, a value that can be reversed with the Not operator. The With statement you used lets you carry out a series of operations in Excel (referred to as "Application" in your macro) without respecifying Application each time. These tools streamline your programs.

Summarize External Database Data in 1-2-3 Release 4.0 for Windows

Q Our tax department uses 1-2-3 release 4.0 for Windows to summarize by county the state sales tax we pay. We download about 20,000 records into Paradox, create a separate table for each county, import it into 1-2-3, then summarize it. It takes hours. Back when we used an add-in that was called @BASE, it reached into an external database and summarized a selected set of values in one step. Is there anything like that for the Windows version?
Steven Lipner, Weehawken, New Jersey

A Nostalgia won't help, Steve, but 1-2-3's DataLens feature will. Take a look at the example shown in **FIGURE 2**. It uses a criterion range in cells A1..A2, an @DSUM seed formula in cell B4, and a data table in cells A5..A8, which the formula uses to calculate the results for each county.

B4		@DSUM(TAXES,"Amount",A1..A2)			
	A	B	C	D	E
1	County				
2	Orange				
3					
4		$1,231,234			
5	Orange	$1,231,234			
6	Wake	$10,234,456			
7	Alamance	$4,543,234			
8	Durham	$8,123,345			
9					

FIGURE 2: USE 1-2-3's DATALENS FEATURE and the @DSUM function to extract and summarize data from an external database quickly.

Let's assume a Paradox database contains your 20,000 tax records, with fields named County and Amount. To set up the example, enter county labels like those shown in column A. Then select *Tools•Database•Connect to External.* Choose *Paradox* in the list of drivers, and if the program prompts you for a password, click *OK.* (If your driver doesn't work, you may need to contact Lotus for an update that works with later versions of Paradox.)

In the next dialog box, enter the path where your database table is located and click *Continue.* When the list of tables appears, click the one you normally use, then click *Continue.* Finally, enter a pseudo range name to identify the table in your formulas (I called mine **TAXES**), and click *OK.* Now enter a formula like the one shown for cell B4: **@DSUM(TAXES,"*Amount*",A1..A2)**, where Taxes is the range name you've specified, *Amount* is the database field you want to extract from, and A1..A2 is the criteria range that specifies the group of records to be summed. The sum of the taxes for the county entered in A2 appears in your worksheet in cell B4. If you want, format the column for currency, as shown in Figure 2.

Once you've gone through this process, you can build the totals quickly for all the other counties. Select A4..B8, then select *Range•Analyze•What-If Table.* In the Number of Variables list, select *1.* Enter **A2** as Input Cell 1, and click *OK.* The What-If command substitutes each value in A5..A8 for the criterion in A2, then recalculates the @DSUM formula and enters the result into the corresponding cell in column B.

Correction

They say there are two things that one shouldn't watch being made—laws and sausages. Now I guess we'd better add *Spreadsheets* to that list. Imagine my chagrin when I received an E-mail from Mike Firth, head of the North Texas PC Users Group, who pointed out that the formulas mentioned in the answer to "In Any Spreadsheet: The Number of Months Between Two Dates" in the November issue was "simply wrong." Due to a tortuous editing problem (since corrected), in every formula provided in that answer the operator in the expression @IF(*end>start* was reversed: the formulas should read **@IF(*end<start*.** Sorry about that, gang.

Here's the corrected formula for calculating the number of months between two dates (in DOS spreadsheets including Quattro Pro and 1-2-3 releases 2.*x* and 3.*x*): **@IF(*end<start*,@NA,@SUM((@YEAR(*end*)−@YEAR(*start*))*12,@MONTH(*end*)−@MONTH(*start*),@DAY(*end*)>=@DAY(*start*),−1))**, where *start* is the cell address of the start date and *end* the address of the end date. In Excel it's **=IF(*end<start*,NA(),SUM((YEAR(*end*)−YEAR(*start*))*12,MONTH(*end*)−MONTH(*start*),DAY(*end*)>=DAY(*start*),−1))**.

By Richard Scoville

Richard Scoville is a contributing editor for PC World *and a software training consultant based in Chapel Hill, North Carolina.* Spreadsheets Q&A *welcomes your questions (see page 12 for contact information).*

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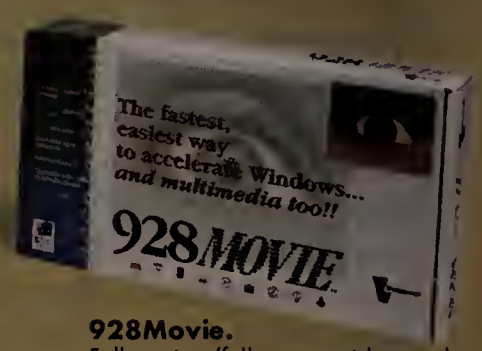

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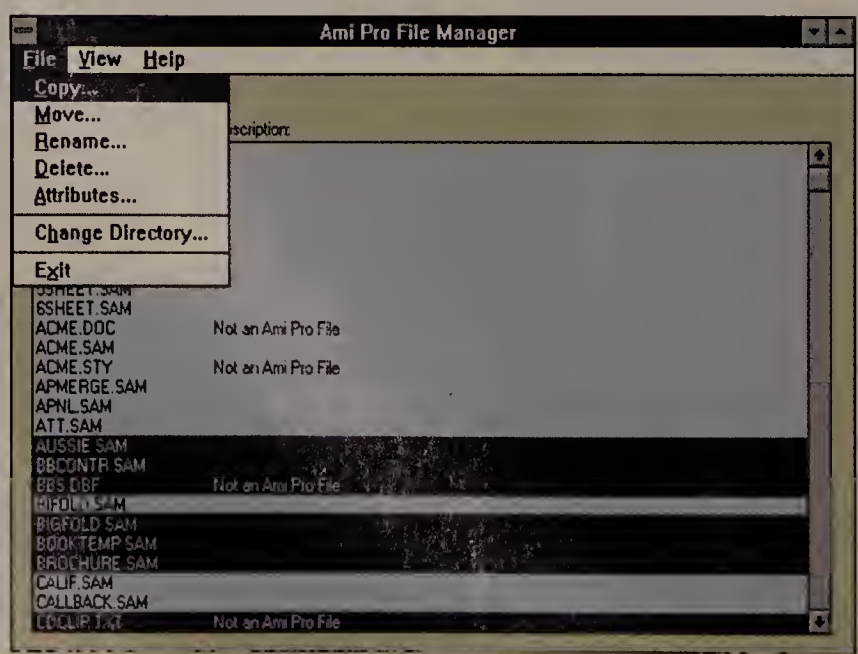
WORD PROCESSING Q & A

WinWord 6.0 Temp Files

Q In your May 1994 column, you suggested that users could speed up performance by redirecting TMP files to an uncompressed partition on a DoubleSpaced drive. I get the idea, but I don't know how to proceed. The SET TEMP= line in my AUTOEXEC.BAT file now reads SET TEMP=C:\TEMP. I also see a drive H: on my system and have no idea which drive is compressed and which isn't. What should I do?
Doug Johnston, Wilmington, Delaware

A When you use DoubleSpace (or the DriveSpace utility that replaced it in MS-DOS 6.22) to compress a portion of your hard disk, it divides your drive into two virtual drives—one compressed, the other uncompressed. On your system, DoubleSpace calls the compressed portion drive C: and the uncompressed portion drive H:.

So to correct your problem, first be sure you have at least 4MB free on drive H: (the more the better). If you do, create a \TEMP directory on drive H:. Then be sure your AUTOEXEC.BAT file has a line that reads SET TEMP=H:\TEMP. If not, add it. Exit Windows and reboot to make your change effective. This should speed up WinWord considerably, along with all your other Windows programs.



MANAGE FILES WITHOUT LEAVING AMI PRO with the program's built-in file management utility.

Deleting Files in Ami Pro

Q Because I spend most of my computing time inside Ami Pro 3.01, it would be handy if I could copy, move, and delete files without switching to Windows' File Manager. Is there any way to do this?
Greg Keith, Petoskey, Michigan

A Sure. Ami Pro has its own rudimentary File Manager module. While it isn't as complete as the Windows File Manager, it can handle many file management chores.

To run it, select *File•File Management.* In the Ami Pro File Manager dialog box, you'll see a list of files. By default, the program displays native SAM files in the current document directory. To view other files, select *View.* You can then either choose *Partial* followed by a DOS wild-card file specification, or choose *All.* To change directories, select *File•Change Directory* and type in a new directory to view. Select one or more files by clicking the file names, then select *File* and choose the operation you want to perform.

WinWord 2.0c, HP DeskJet 560C, and Envelopes

Q I use Word for Windows 2.0c with a Hewlett-Packard DeskJet 560c. When I try to use the Tools•Create Envelope command and then click the Print Envelope button in the dialog box, I see the usual WinWord printing message, but nothing comes out of my printer. I don't even get an error message. I called Hewlett-Packard and got its latest Windows driver for the DeskJet (version 4.1), but that didn't help. What's happening, and how do I fix the problem?
John Byrne, Beale Air Force Base, California

USER GROUP TIP

Keyboard Font Sizing in WinWord 6.0

To quickly change the font size of selected text in Word 6.0 for Windows, hold down <Ctrl>-<Shift> and press > (the right angle bracket) to increase the font size or < (the left angle bracket) to decrease it.

Ginger Chadwick
Richmond PC User's Group

A I hooked up the same printer, reinstalled WinWord 2.0c, and got the same result: no envelope. So I dug around and came up with a surprising solution. Like most DeskJet users, you've told WinWord to print your documents in reverse order so they'll emerge from the printer stacked in the proper sequence. For some reason, this setting doesn't work with envelopes.

The solution is to print envelopes in regular order. To do so, select *Tools•Options,* then click the *Print* icon. Clear the *Reverse Print Order* and *Draft Output* check boxes, then click *OK.* Load some envelopes into the printer and try the *Tools•Create Envelope* command again. All should be well. Just remember to reselect *Reverse Print Order* when you return to printing normal documents or they'll be stacked in reverse sequence. If you generally use draft printing, you'll have to reselect that check box, too.

Envelope Bar Codes in WinWord 2.0

Q After reading about WinWord 6.0's FIM envelope bar-code feature in "Windows Word Processors: Wizards Versus Coaches" [March 1994], I was inspired to see whether I could print these bar codes from Word for Windows 2.0c (unfortunately, my hardware isn't quite up to the task of running Word

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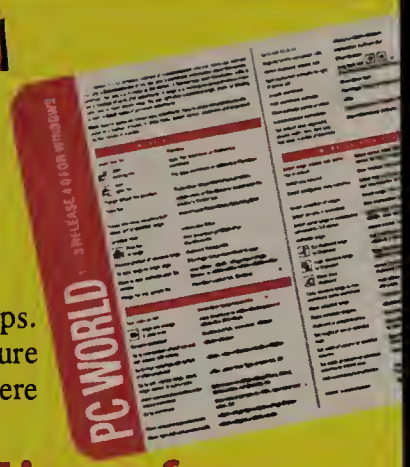

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Circle 107 on reader service card

6.0). Using some preprinted envelopes as an example, I created an image of these bars in Paintbrush. I then popped the resulting bit map onto my envelope template. But when I print the envelopes on my laser printer, about ¼ inch of the bit map is cut off—a violation of Postal Service standards. Is there a way I can print these bar codes clear to the edge of the envelope?
Karl Baron, Campbell, California

A For those of you who didn't read the word processor review, FIM (Facing Identification Mark) bar codes are located to the left of the stamp at the top of the envelope; the codes tell the post office's automatic sorting machinery which side of the envelope is which. This feature speeds up sorting and delivery.

The answer to your question is, in a word, no. Your laser will not print in the outermost ¼ inch of your envelope, which is why your bar code graphic was cut off. There's no way to force your printer to print on that last ¼ inch of the envelope, or of any sheet of paper, for that matter.

But there's good news. I checked with my postmaster, who told me that FIM bar codes don't have to reach the edge of the envelope. So move your bit map down ¼ inch, and the post office will be able to use your FIM markings.

Unwanted Subtractions in WordPerfect 6.0 for Windows Tables

Q Whenever I type a hyphenated number (such as a telephone number) in a WordPerfect 6.0 table cell, something strange happens. WordPerfect subtracts the numbers, even though I have the cell's format set to General. If I type, say, 555-234-5678, the program turns the number into –5357. Stranger yet, this doesn't happen on a coworker's system, even though both PCs seem to be set up the same way. How do I fix this problem?
Alice Markham, Boise, Idaho

A This one's a head-scratcher. Try as I might, I couldn't duplicate your results. Then, almost by accident, I checked Cell Formula Entry in the Table menu. This option tells WordPerfect to treat items entered into table cells as formulas. From that point on, I got the results you're experiencing. Somehow, you have accidentally turned Cell Formula Entry on, so when you type your telephone number or another hyphenated number, WordPerfect treats the number as a formula and, mistaking the hyphens for minus signs, blithely performs the math.

The solution is simple: Assuming that you don't have any formulas in your table, deselect *Table•Cell Formula Entry*. Instead of treating hyphenated numbers as formulas, WordPerfect will now leave them alone. You'll have to reenter the numbers in all the cells in which subtraction has occurred. Each time you do, you'll be asked to confirm the change. Just answer *Yes*.

To include both hyphenated numbers and formulas in your table, keep Cell Formula Entry turned on and then format the cells containing the hyphenated numbers as text. To do this, highlight the cells you want to format, select *Table•Number Type*, then select *Text* under Available Types.

COMING UP

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PC WORLD

Importing ASCII Documents in Ami Pro 3.01

Q Our office recently switched to the Lotus SmartSuite, so we're all learning Ami Pro 3.01. It's straightforward and imports our old documents acceptably, except for one type. When we try to import ASCII files that use a carriage return to end each line, Ami Pro removes those returns and rewraps the document into a new format. Is there a way to preserve the line endings in these ASCII documents when we import them into Ami Pro?
Steven Shippee, Yuma, Arizona

A When importing ASCII files, most people want the text to rewrap for easy editing. That's why Ami Pro removes extra carriage returns by default. Fortunately, Ami Pro can also import these documents with your original line breaks intact. Here's how:

In Ami Pro, select *File•Open*. In the Open dialog box, choose *ASCII* from the List Files of Type drop-down list. Click *ASCII Options*. Now select *CR/LF at paragraph only* and click *OK*. Back in the Open dialog box, open one of your preformatted ASCII files. You'll see that the line endings are preserved after you import it. What's more, the change you made in the ASCII Options dialog box become the new default, so you'll only have to do this once.

Rotated Table Labels in WPWin 6.0a

Q I'm always putting tables in my documents and have found that WordPerfect 6.0a for Windows has excellent tools for the job. What I can't figure out is how to rotate text in a cell to make a vertical label. I've searched in the manual and online help, but to no avail. Is there a way to do this?
Jim Jorgensen, Milwaukee

A Actually, you didn't miss a thing—there's no direct way to create vertical text in a table cell. But all is not lost, since there's an easy, if roundabout, way to do it using text boxes. The procedure involves several steps, so if this is something you're going to do again and again, consider recording a macro to automate the process:

1. Click the cell where you want a vertical label. If the text you want is already in the cell, highlight it and cut it to the clipboard.
2. Select *Graphics•Text Box*, or click the *Text Box* icon.
3. Click the *Border\Fill* button, select *None* for both Border Style and Fill Style, then click *OK*.
4. Type or paste the desired text into the text box.
5. Click the *Content* button.
6. Click *90 Degrees* (to make the text read from bottom to top) or *270 Degrees* (for top-to-bottom orientation) in the Box Content dialog box.
7. Click *OK*, then *Close*.

Your text should now appear rotated in the cell, with the cell height adjusted to fit the text box. You can resize the text box by selecting it and dragging the sizing handles. Repeat the previous steps as needed to modify other cells.

By George Campbell

George Campbell is a contributing editor for PC World. Word Processing Q&A *welcomes your questions (see page 12 for contact information).* ■

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WINDOWS Q & A

Windows for All Occasions, Part 1

Q When our secretaries load Windows on Friday mornings, I'd like them to get a message reminding them to back up their files and update their indexes. Since I don't want the message to pop up on other days, putting it in their StartUp groups—so it loads automatically when they launch Windows—won't do. What's more, since the secretaries aren't necessarily looking at the screen while Windows loads, the message needs to be on screen when the loading finishes and must stay until they remove it. Any suggestions?
Susan Booher, College Station, Texas

A Windows 3.1 doesn't provide a way to start programs automatically on one day but not another. Luckily, you can use DOS batch files and a little file-switching magic to do the job.

First, use File Manager to copy the computer's existing StartUp group (STARTUP.GRP) to a new file named **STARTUP.REG**. Next, create your reminder message; I recommend using Paintbrush for real impact (see **FIGURE 1** for an example). Once your message is done, save it and exit Paintbrush. With File Manager and Program Manager both on the screen, open your Program Manager's StartUp group and then drag the new Paintbrush file from File Manager into the StartUp group. As long as this is the last item that you have added to the group, it will be the last to launch when you start Windows. To save this StartUp group, hold **<Shift>** and select *File•Exit•Windows* in Program Manager.

FIGURE 1: CREATE EYE-CATCHING REMINDERS in Paintbrush, then launch them automatically when you load Windows.

Now return to File Manager and select *STARTUP.GRP*, then press **<F8>** to copy the file to **STARTUP.FRI**. Now restore your previous StartUp group by copying STARTUP.REG to STARTUP.GRP (when asked if you want to overwrite the existing file, say *yes*).

Next you have to create a couple of text files. So open Notepad, and in a new file press **<Enter>**, then type **set answer=**. Make sure there is no space before the equal sign and no carriage return at the end; the equal sign should be the last character in the file. Save this file as **TEMPLATE.TXT**. Now choose *File•New* to start typing the batch file, which should look like the one in **FIGURE 2** (naturally, you'll want to change file and path information to suit your system). Then save this file with an easy-to-type name such as WN.BAT, for example. If you have Save Settings on Exit checked on the Program Manager's Options menu, uncheck it for now and exit Windows; you can recheck it later if you like.

```
@echo off
c:
cd\windows
copy template.txt result.bat
date < template.txt | find /c "Fri" >> result.bat
call result
If "%answer%"=="1" goto Friday
win %1 %2 %3
goto end
:Friday
copy startup.grp *.reg
copy startup.fri *.grp
win %1 %2 %3
copy startup.grp *.fri
copy startup.reg *.grp
:end
```

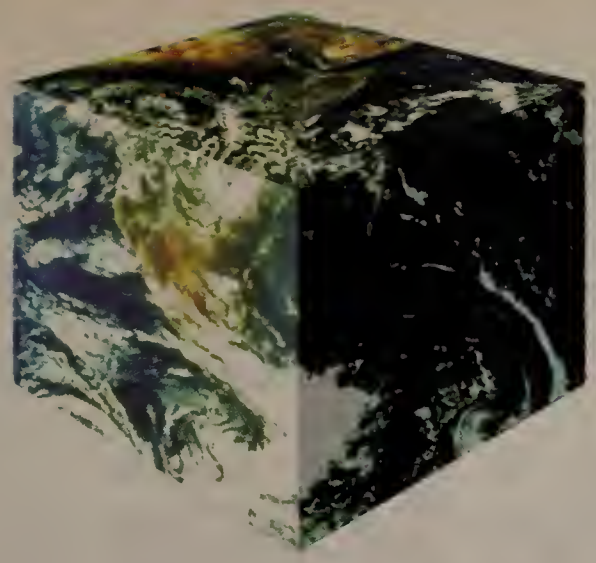
FIGURE 2: CUSTOMIZE WINDOWS STARTUP with a batch file like this one to run certain programs on Fridays only.

If you start Windows with the WN.BAT batch file from now on, you'll get your message on Friday and only on Friday. If Windows starts from the AUTOEXEC.BAT file of each computer, be sure to change that file's WIN command to CALL WN. Once you've got this working on one machine, copy the new files to all the computers that need reminders.

Here's how the batch file works: '@echo off' hides the batch file text, and the next two lines make sure you're in the right directory. The fourth line copies the template to a new batch file, ensuring a clean template each time.

The 'date' line—the heart of the batch file—runs the DOS DATE command, passing it the template file as a way to feed it a carriage return, and searching for the text 'Fri' in its results. The line then passes the FIND results—1 if it has found the text and 0 if it hasn't—to the RESULT.BAT file. RESULT.BAT will now read 'set answer=1' if it's Friday and 'set answer=0' if it isn't. Quite a bit of work for one batch file line!

Next, the batch file calls RESULT.BAT to set the answer variable to 1 or 0. If the answer variable is 1, the next line jumps to the line labeled ':Friday' and continues with the commands below that point. These commands copy some files to switch you over to the Friday StartUp group without losing your current weekday version, then they launch Windows. When you exit Windows, the batch file changes the files



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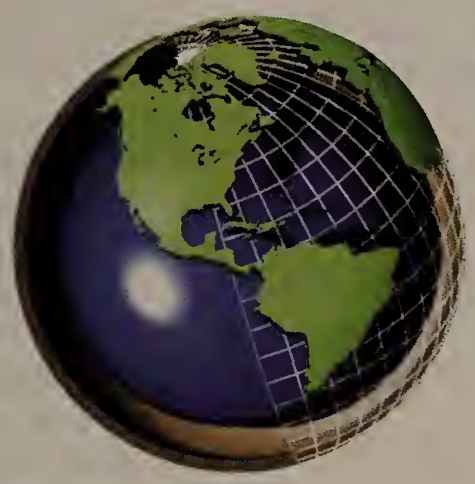

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back again. If the answer variable is 0, the batch file starts Windows and then goes to the :end label to skip all the Friday stuff. Either way, you get the results that you need.

Windows for All Occasions, Part 2

Q I'd like Microsoft Anti-Virus for Windows, which came with MS-DOS 6.*x*, to run automatically once a month. Is there a way to do that?
Paul DiLorenzo, Banning, California

A The batch file in the previous tip can work for you, too, with a few modifications. The good news is that, since you don't need Anti-Virus to load last, you don't have to muck around with your StartUp group. This makes the whole process much simpler.

First, create the TEMPLATE.TXT file as instructed in the last tip, as well as a batch file like the one in Figure 2. In your case, however, change the 'Fri' in line 5 to **15**. This will make your batch file run your custom configuration on the 15th of every month. (You can use any number between 13 and 28 except 19.)

Next, use Notepad to replace the lines between ':Friday' and ':end' with **win %1 %2 %3 c:\dos\mwav.exe c:**, adjusting path and file names as needed. When you start your computer on the 15th of the month, Windows will automatically load Anti-Virus and scan your C: drive.

Now the bad news: If you don't use your computer on the 15th, Anti-Virus won't scan your drive that month. I haven't figured out a batch-file fix for that problem (if you have, I would love to hear from you), but I did find a freeware program—Schedule, by David Butler—that can do this trick. This DOS program lets you schedule events to occur once a day, week, month, or year. If you don't turn on your computer for a few days, Schedule will run any pending events the next time that you start your system. The program is available as SCHEDULE.ZIP on PC World Online.

Batching in Windows

Q I have two INI files for the same application; sometimes I want to launch it with one file, sometimes with the other. I'd really like to have two separate icons, each launching the program with a different INI file, but I haven't come up with a way to do this. I thought of attaching each icon to a batch file that swaps INI files and launches my application, but I haven't been able to figure out how to launch a Windows application from a batch file. Do you have any idea how I might do this?
Mark Stewart, Allen, Texas

A You can't launch Windows programs from regular DOS batch files (at least not from within Windows), but there are two work-arounds. You can either use three icons or get a utility that accepts DOS and Windows commands.

For the first solution, make batch files that will copy your setup files over the existing INI file but won't launch the program. Then, in your application's Program Manager group, assign an icon to each batch file. To start your program, first double-click one of the batch file icons, wait until the batch file is finished, then launch the program.

A second, and better, solution is to get a command-line utility that can launch Windows applications from batch files. The one I use is a terrific bit of freeware by Darrell W. Burgan called Imposter (available as IMPOST.ZIP on PC World Online). With Imposter installed, simply create batch files that swap your INI files and launch your program. When you save the batch files, give them the extension IPS rather than BAT, so Imposter can launch them automatically. Then just drag them into Program Manager for easy launching. When you launch an IPS file, Imposter runs it, then politely disappears.

Imposter works fine if loading an application is the last thing your batch file does, but it won't automate tasks that happen *after* you've exited the app. That's because it won't wait for you to exit a program before processing other lines in the batch file. Luckily, there are commercial command-line programs that will wait for you, including a version of Imposter called Landmark DOS for Windows. For information about other similar programs, see "Forget the Mouse, Type Commands in Windows" in *New Products*, July 1994.

- **Landmark DOS for Windows** $49; Landmark Research; 800/683-6696
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By Scott Dunn

Scott Dunn is a contributing editor for PC World *and coauthor of* 101 Windows Tips and Tricks *(Peachpit Press, Berkeley, California,* 1992). Windows Q&A *welcomes your questions (see page 12 for contact information).*

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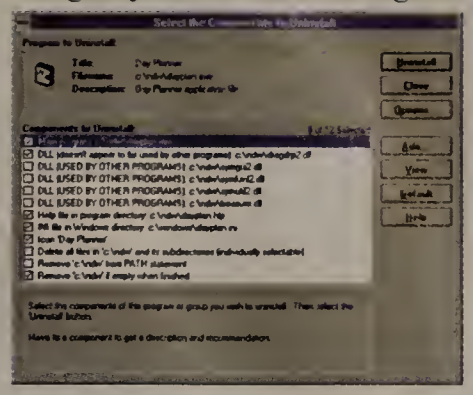

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DATA MANAGEMENT Q & A

Switching to Design Mode in Access

Q How can I switch an Access report to Design mode while previewing it? In Preview I don't see a Toolbar icon or a menu choice for Design.
Barry Parducci, New York

A If you open your report in Design mode from the Database window, you can switch back and forth between Design and Preview with either *File•Print Preview* or *File•Sample Preview*. Print Preview displays your report exactly as it will print, while Sample Preview—which comes up faster—shows you only a few records and ignores some of the complex behind-the-scenes querying. To go back to Design mode, simply deselect *File•Print Preview* or *File•Sample Preview*.

Paradox Encryption in Approach 2.1

Q I recently started using Approach 2.1 to create reports from Paradox data coming out of my firm's sales department. For the most part, things have gone smoothly, but sometimes when I try to open a Paradox file a dialog box asks for a password. The sales department people insist none of their files are password protected. What's wrong?
Mimi Green, San Francisco

A Approach 2.1 asks you for a password if you try to open a file created with Paradox 4.0 or a later version. Your version of Approach can't read these Paradox files and assumes they must be encrypted. You have a couple of options if the file is in Paradox 4.*x* format.

You might get the sales department staffers to create what Paradox calls a "compatible" version of each file you want to use. They can do this in the DOS version of either Paradox 4.0 or 4.5 (Paradox for Windows doesn't offer this capability). First, they should make a copy of the file, retaining the original in its native format. Then they can select *Modify•Restructure* and the file name of the new copy. When the structure of the file is on screen, they can select *FileFormat•Compatible*, then press **<F2>** to change the file's format.

This approach may not be practical if people update the Paradox file often, because someone will have to copy and reformat the data regularly for you. There'll also be a problem if the Paradox 4.*x* file has field types Paradox 3.*x* doesn't support. You could upgrade to Approach 3.0, which supports Paradox 4.*x* files directly. But if your sales department is using Paradox 5.0, forget it; Approach doesn't yet support it.

One-Step Sorted Approach Reports

Q Approach 2.1 is easy to use, but I find one thing annoying: When I list a certain file, I always want it sorted in a particular way. Each time I open the file and switch to the List view, I have to use the Sort dialog box to reorder the records. Isn't there a way to set a sort order permanently, or to save one with a report design?
Oliver Simpson, Tampa

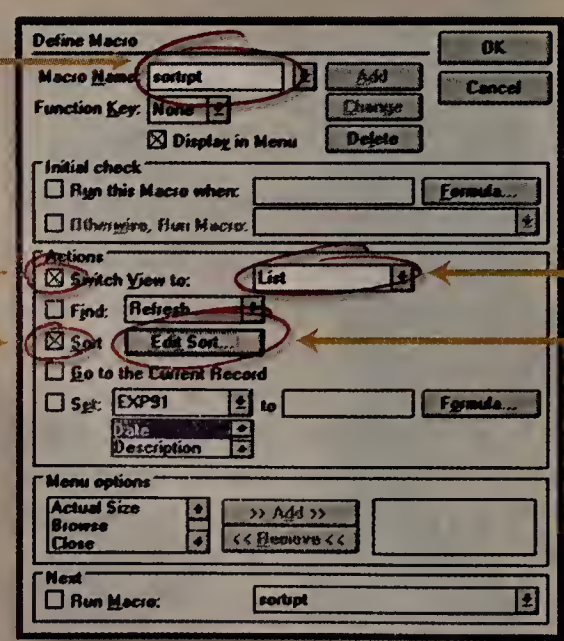
A You can't save a sort order along with a report, but you can define a macro that switches to the List view (or a specific form or report) and sorts the data in a single step. Then you can run the macro whenever you need to use the sorted report. The word *macro* may conjure up images of hours spent writing code and sweating over manuals, but with Approach it's strictly a point-and-click affair. Here's how you can accomplish this.

Choose *Edit•Define Macro* to open the Define Macro dialog box. Enter **sortrpt** for the macro name. Under Actions, turn on the *Switch View to* option and select *List* from the drop-down menu next to it. While still in the Actions section, turn on the *Sort* option and click the *Edit Sort* button. This brings up the familiar Sort dialog box, which you can fill in as you wish. When you return to the Define Macro dialog box, click the *Add* button near the top, then click *OK* to save the new macro. Remember to save your view file when you exit Approach.

From then on, use the macro to go into List view. With the data file up, select *Edit•Run Macro•sortrpt*. You'll see your data sorted as you prefer it.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World *and the author of* The Paradox 5.0 for Windows Handbook *(Random House Electronic Publishing, New York, 1994).* Data Management *welcomes your questions (see page 12 for contact information).*



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Circle 74 on reader service card

PUBLISHING & PRESENTATIONS MAKEOVER

The Gray-Flannel Newsletter

Out of the grab bag this month comes the newsletter *Profit Ability*. Financial analysis manager Keith Herrmann started it as a hobby, hoping to see it become profitable. He understands dollars and cents but not page layout. His cover letter to *PC World* says it all: "My current design does not look professional and is difficult to read."

Our objective, then, was clear: to design a template that would add polish to his newsletter. A template would also make future editions quick to assemble.

A Uniform Approach

Herrmann used WordPerfect for DOS to create the newsletter. To explore how he might improve his newsletter without new software, we redesigned in WordPerfect too, but switched to WordPerfect for Windows, a $99 upgrade. Its what-you-see-is-what-you-get and drag-and-drop capabilities make the layout process easier than using Print Preview to see what you're doing.

Herrmann's current layout is a full, unrelieved page of text. It's the publishing equivalent of baggy sweats—formless and informal. Since this is a commercial financial report for professionals, we wanted something more along the lines of a classic pinstripe suit.

We imposed a newspaper-style three-column grid—far easier to read than a pagewide block of type. Unfortunately, WordPerfect's column format is limited. For example, we set the headline in a text box because WordPerfect doesn't let headlines span multiple columns.

To help define the grid, we set a 9-point-thick rule beneath the newsletter's name, and 6-point rules below the headline and secondary head. These rules, accessible from WordPerfect's Graphics menu, lend additional emphasis to the masthead and heads—elements we want the reader to notice at first glance—as well as further breaking up the gray columns of text.

Dressing It Up

Once we established a classic look, we used subtle design details to add touches of individuality—much like accessorizing a business suit with a colorful tie. That meant choosing distinctive fonts as well.

Herrmann used Courier, an unrefined typewriter face, everywhere but in the masthead. We substituted elegant 8-point Garamond for the body text, 48-point Garamond Bold for the masthead, and Neographic (in 18 and 24 points) for the heads.

We gave the table of contents a border, filled it with a 10 percent black screen, and topped it with a graphic. For the latter, we scanned part of a ten-dollar bill and imported the image into a graphics box as a TIFF file, cropping and brightening it with WordPerfect's graphical editing tools. (The program's clip art also could have been used.)

Off the Rack

To create a template, we saved most page elements as WordPerfect styles or design macros. For example, we saved the volume, issue, and date, along with the heavy black rule, as a style. Now all Herrmann has to do is change the numbers. And despite all the new graphical elements, we were able to include both the lead story and an article from the second page. The moral: You don't have to give up style to create a polished newsletter in a word processor.

By Valerie Singer

Terry Lockman and Barbara Wolkoff, of Lumina Designworks in San Rafael, California, performed the document redesign. Valerie Singer is an editorial intern at PC World. Publishing & Presentations *welcomes your questions and makeover candidates (see page 12 for contact information).*

Before

PROFIT ABILITY

Volume 1, Number 1 — May 15, 1994

IN THIS ISSUE

Introducing a newsletter entitled "Profit Ability"

Managing your accounts payable cash outflow

Making sure your research and development is commercially viable

Increasing productivity in a manufacturing plant

Counterbalancing the downside of small orders

Questions and answers

WHY "PROFIT ABILITY"?

We've decided to title this newsletter "Profit Ability." Why Profit Ability? Let's explore a few current alternatives. The word "Quality" is popular. The meaning of the word quality has expanded, and now it has become a composite of all the positive qualities required for business success. The advocates of quality suggest a simple formula: Quality = Business Success.

The word "Productivity" is beginning to be used in much the same way: it, too, means all the things one has to do in order to be successful in business.

The intent of this newsletter is to help make you a business success. We wanted the title of the newsletter to reflect this orientation. We could have called this newsletter the "Quality" newsletter or the "Productivity" newsletter. We're more straightforward than that.

We asked ourselves, "What is the ultimate measure of business success?" . There's only one answer. While quality may lead to success and productivity may well be a prerequisite to success, we never fully agreed that quality and productivity were one and the same as success. Rather, our focus is on the ability to produce a strong bottom-line.

The ultimate measure of business success is Profit Ability. Profit Ability seeks to actively involve its readership, with a goal of sharing with each other those excellent practices that enable consistent and continuous long-term profitability for American business. As an experienced business person, you are invited to share your knowledge with other readers by submitting responses to our questions and by writing articles on your areas of expertise. We desire that our readers communicate, experiment, and share notes. Throughout this newsletter, please keep your eye out for opportunities to participate in Profit Ability.

Profit Ability, P.O. Box 94, Owings Mills, MD 21117-0094

After

PROFIT ABILITY

Volume 1
Number 1

May 15, 1994

IN THIS ISSUE

- G YOUR S PAYABLE FLOW
- MAKING SURE YOUR RESEARCH AND DEVELOPMENT IS COMMERCIALLY VIABLE
- INCREASING UCTIVITY IN A FACTURING
- ERBALANCING THE DOWNSIDE OF SMALL ORDERS
- QUESTIONS AND ANSWERS

Profit Ability, P.O. Box 94, Owings Mills, MD 21117-0094

Introducing a Newsletter Entitled "Profit Ability"

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experiment,
Throughout this newsletter, please keep your eye out for opportunities to participate in Profit Ability.

ARE YOU MANAGING YOUR DAYS PAYABLES?

Considerable time and attention is spent managing DSO, or days sales outstanding in accounts receivable. In essence, DSO measu
number of days it tak
dollar of sales. But h
our vendors faster th
our Days Payable co
than our DSO? Do v

To answer this qu
want to graph your D

Our formula for D
Month-end Accounts
divided by (Total A/P checks paid for the last three months divided by 90). In other words, the ending payables balance divided by the average checks paid per day over the last three months.

The objective for days payable is for it to be greater than or at least equal to days sales outstanding. One factor, however, which reduces days payable is the profitable taking of 2%/10 cash discounts. Of course, early paying with a 2% discount makes sense, since it represents a
income. Pay
careful exam
industry you
ability of you
timely. Our

The image of a ten-dollar bill adds visual interest and underscores the newsletter's subject.

A 10 percent black tint draws attention to the table of contents, but isn't so dark that it makes the text unreadable.

We set the masthead in distinctive Garamond Bold and, in WordPerfect's Typesetting dialog box, tightened the letterspacing.

Switching from a single wide text block to a classic three-column grid helps readers navigate the page and makes the text easier to read.

We substituted a classic typeface, Garamond, set flush left, for the original's unsightly Courier.

COMMUNICATIONS Q & A

The Ins and Outs of WinCIM Downloads

Q I'm new to the online world and hope you won't find my question silly. I was browsing through a CompuServe library and found a file I wanted to read. I selected Retrieve in the Windows version of CompuServe Information Manager [WinCIM], thinking it would show me the file on screen. Instead, all I saw was a bar graph that appeared briefly. What happened?
Peter Martin, Chicago

A Congratulations—you've just performed a successful file download. When you download a file from a service such as CompuServe, you're telling the service to send you a copy of the file over the phone line and write it to your PC's hard drive. The bar graph you saw was charting the download's progress.

Where the file ended up depends on how you've set up WinCIM; by default, the program stores the file in the subdirectory \CSERVE\WINCIM\DOWNLOAD. To find the downloaded file in WinCIM, select *File•Open*. Then, in the directory-tree box to the right, select the *Download* directory, and click the name of your file.

What should you do with the file now that it's on your system? If it's a text file or GIF image file, WinCIM should be able to display it for you. If it's an image file with an extension other than GIF, you'll need a graphics program, such as Paint Shop Pro, to look at it. If its extension is EXE, it's probably a self-extracting compressed file; to decompress it, double-click it in File Manager. Finally, if its extension is ZIP, you'll need the file archive program PKZip to decompress it. (You can use your newfound downloading skills to retrieve that program from CompuServe.)

Tapping Into Global Markets Online

Q I'm interested in using online services to track my investments. Do you know of any books that can help me get started with this?
Ann Franco, Muskegon, Michigan

A *The Business Week Guide to Global Investments Using Electronic Tools*, by syndicated computer columnist Robert Schwabach, is a terrific place for you to start your reading. Schwabach's utterly iconoclastic attitude toward everything from Prodigy's overpriced online brokerage to the viability of south-of-the-border mutual funds make this the online investing book everybody's been waiting for.

The book also comes with three software packages: a powerful technical analysis program, a utility for tracking downloaded stock prices, and an online information database. If you're at all interested in online investing, this book is a worthwhile buy.

You might also want to read the article "15 Ways to Leave Your Broker" (September 1994).

- **The Business Week Guide to Global Investments Using Electronic Tools** $39.95; Osborne/McGraw-Hill; 800/227-0900
  Reader service no. 722

Logging Voice Calls Made by Modem

Q Is there any way to use a modem to place voice telephone calls? Ideally, I'd like the communications software to log the time and duration of each call and then save that information in some kind of spreadsheet.
Ramma Sattiraju, East Brunswick, New Jersey

A Virtually all contact managers let you use your modem to place voice calls, and they automatically log the time and date of the call. The programs even allow you to add notes to the log.

Two of my favorite commercial applications are NetManage's Ecco ($99 for the "lite" Simplicity version, $279 for the Professional package) and Symantec's Act ($279). Various shareware programs can also handle automatic phone logs. My favorite in the DOS realm is Contact Plus Personal ($99 to register); it's available on PC World Online as CPLUS2.ZIP. For Windows devotees, there's KBS: People Management System ($79 to register) from KBS Systems. You can download the program from PC World Online; look for a file named KBSPMS.EXE.

- **Act** $279; Symantec; 800/441-7234
  Reader service no. 723
- **Contact Plus Personal** $99; Contact Plus; 800/366-9876
  Reader service no. 724
- **Ecco Simplicity** $99, **Ecco Professional** $279; NetManage; 800/457-4243
  Reader service no. 725
- **KBS: People Management System** $79; KBS Systems; 800/527-9422
  Reader service no. 726

Jalopies on the Info Highway

Q I'd like to buy a 14.4-kbps or 28.8-kbps modem, but I'm afraid my old 286 PC might be too slow to work with these modems. Is this true?
Robert Enray, Internet

A Yes and no. You can use an external 14.4-kbps modem with your antique 286, but for the PC to keep up with the modem's fast data flow, you should invest in a speedy serial card with a 16550A UART chip. You can buy one for under $100 from any PC catalog; a good buy is Hayes's $99 ESP Communications Accelerator. Just be sure you get a card with buffering ability to keep incoming data in memory while your PC processes other data. If you plan to buy a 28.8-kbps modem, you'll need to spring for a new PC to take advantage of the modem's highest speeds.

- **ESP Communications Accelerator** $99; Hayes Microcomputer Products; 404/441-1617
  Reader service no. 758

By Judy Heim

Judy Heim is a contributing editor for PC World *and author of* I Lost My Baby, My Pickup, and My Guitar on the Information Highway *(No Starch Press, Daly City, California, 1995).* Communications *welcomes your questions (see page 12 for contact information).*

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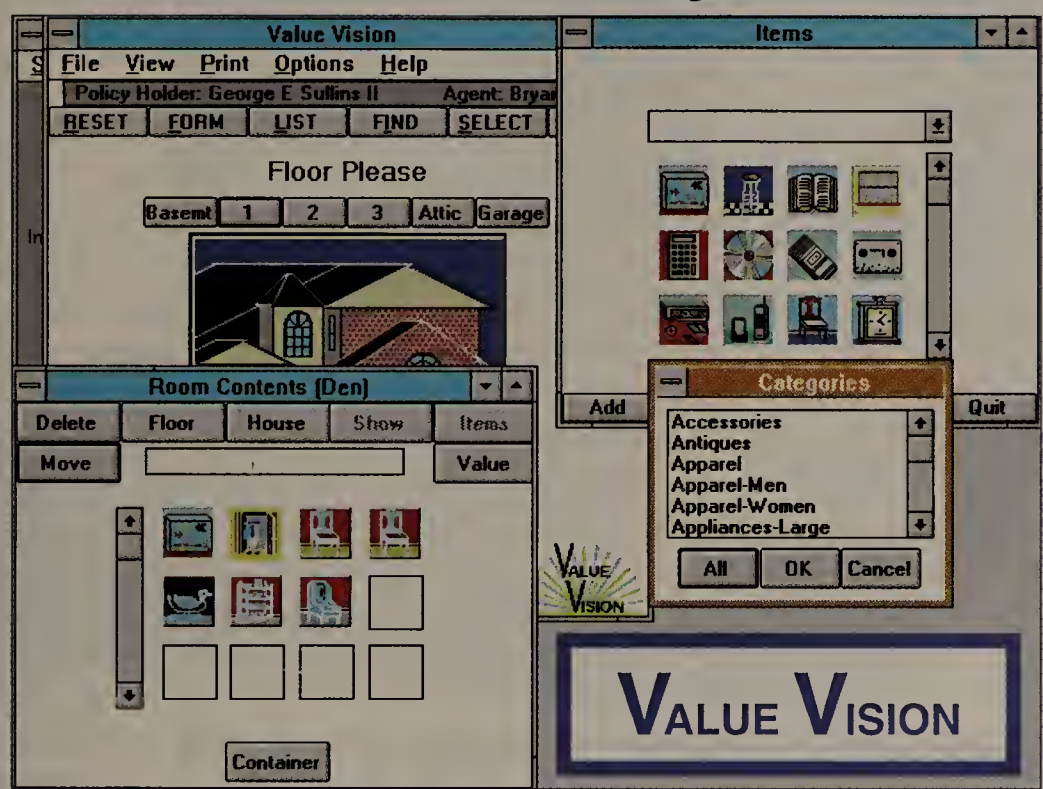

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P501

HARDWARE Q & A

BIOS Upgrades

Q In your September column ["A Hard Disk That's Missing Something"], a reader asked how to recover the unused 34MB on a new hard disk, because none of the new drive types in his system setup routine matched his new drive. You suggested that he first look for a user-definable drive type and fill in the blanks; if that didn't work, you recommended he spend $30 for Micro House's EZ-Drive.

You missed one important point: He should investigate the availability of a BIOS upgrade. Although many systems have limited support for drives, this doesn't necessarily mean the BIOS manufacturer won't have an update that supports other drives, or at least a user-definable drive type. I recently upgraded a Phoenix BIOS by calling Micro Firmware (405/321-8333). The replacement BIOS chip set (which included a keyboard BIOS chip with better response) had all the features one would expect from a recent BIOS, including support for user-definable drives.
Lewis Rosenthal, Yonkers, New York

A Great solution! If the BIOS manufacturer has an update for your motherboard make and model, and if you're comfortable swapping chips, go for it. Also note that if you have a newer system, it may have a flash BIOS, which you can update by running a floppy-based routine. Before you try replacing chips, check with the system manufacturer to see if flash BIOS upgrades are an option.

The FCC and Your PC

Q I recently swapped motherboards and upgraded my computer to a 486SX-33. I also bought a new case and hard disk. I've heard the Federal Communications Commission (FCC) requires all PCs to meet something called a Class B rating. How do I know if these components comply, and what are the consequences if they don't?
Harold Conklin, Bakersfield, California

A That's quite an upgrade. As you may know, PCs give off microwave signals that can interfere with TV reception. The FCC Class B rating stipulates that a computer should not create interference with a device that's farther than 10 feet and one wall away. All home computers should comply with Class B, but don't sit around worrying that FCC agents will come barging through your front door anytime soon. However, if your system causes interference and the neighbors complain, you'll be forced to move your PC to another location.

The 386-to-486 Transformation

Q I have a 386DX. According to ads I've seen, I can drop in an upgrade chip and instantly have a 486DX PC. I am ready to pay the $300 to do it, but wonder if the speed is really comparable to that of a true 486 PC. Won't I lose something in the process?
Patrick Canady, Annandale, Virginia

A What kind of performance you get depends on the original 386 and the upgrade chip you're installing. For example, if you add a $350 Cyrix 486-DRx2 upgrade chip to a 386DX-33 system, it performs like a 486SX-25—but that's only about a 20 percent improvement. Spend $779 on Evergreen Technologies' clock tripler upgrade, and you'll get 486SX-33 performance. Problem is, you'll still have an old system with parts (the drives, power supply, and so on) that will wear out sooner rather than later. Before spending $780 or even $300 on an upgrade, remember that you can get a new 486 system with a big hard disk for less than $1000. And you can give the old 386 to the kids.

Hard Disk Disaster

Q Recently my hard drive just conked out. It wouldn't boot, and the furthest I got was the message 'Error loading operating system'. I ran my Rescue Disk (created with The Norton Utilities), which reported that my hard disk had 'physical defects' on it. So is my hard disk dead? And what can I do about it—is there a remedy?
Amir Rashid, Lahore, Pakistan

A Sounds pretty bad. The fact that Norton can access the hard disk means that your drive and PC are communicating with each other, but the hard disk itself is badly messed up. Try Norton's *Make Disk Bootable* option, reboot, and see if the drive comes up. If it does, copy all essential files off your hard disk immediately. Then use The Norton Utilities' Calibrate or Gibson Research's SpinRite to do a nondestructive low-level format, assuming your hard disk allows it. Even if this works, you should back up frequently and probably start shopping for a new drive.

Unfortunately, not many IDE or SCSI drives let you do a low-level format. If yours won't cooperate, you may still be able to use Norton's Disk Editor to painstakingly copy chunks of data to floppy disks. This is worth doing, however, only for vital information. The Disk Editor is hard to use, and the data will be in small chunks because DOS stores files in pieces all over a disk—expect to spend hours searching and copying. (By the way, even if you can't get the drive to boot, a low-level format may still work. This process rewrites the magnetic grid of sectors your hard disk uses to store data.)

If there's lots of important data on your disk and you don't have a recent backup, then it might be time to call in the pros. I know of three services that will do all they can to recover data from a badly crashed drive: Group One Electronics (818/993-4575), Ontrack Data Recovery (800/752-1333), and Workman and Associates (818/791-7979).

By Eric Knorr

Eric Knorr is a contributing editor for PC World *and the editor and principal author of* The PC Bible *(Peachpit Press, Berkeley, California, 1994).* Hardware *welcomes your questions (see page 12 for contact information).*

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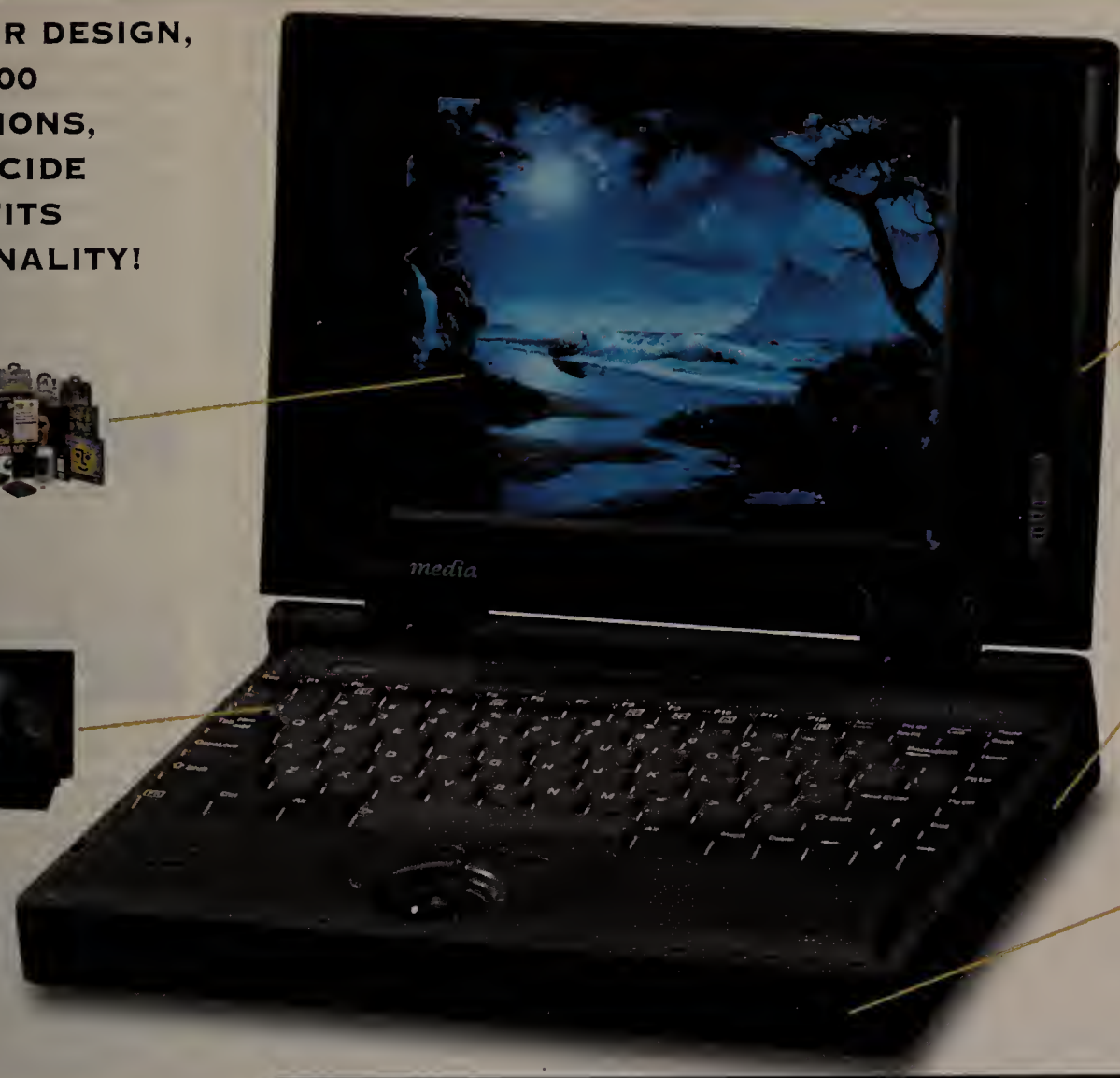

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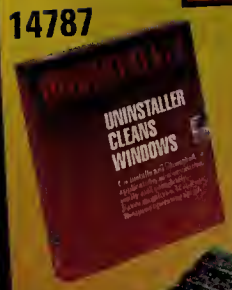

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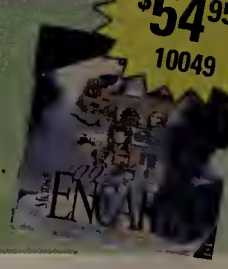

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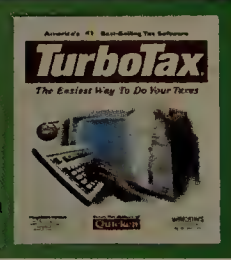

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STAR-DOT-STAR TIPS

Sorting Word Sections

An undocumented feature of Microsoft Word 6.0 (and 6.0a) for Windows lets you sort your document's sections based on each section's headings. To sort sections, first display the document as an outline using *View•Outline* or the outline button (located to the left of the horizontal scroll bar), select the headings you want to rearrange, then choose *Table•Sort Text*. Subheadings and body text stay with the relocated headings just as you'd expect. Note: To use Word's Outline view, your document's section headings must use the default outline style: Heading 1, Heading 2, and so on.

Frank Filz, Cary, North Carolina

Editor's note: Most Word for Windows users don't take advantage of or even know about the program's outlining features, and as Filz notes, they're not documented. Nonetheless, they're well worth learning about. This tip illustrates only one way in which structuring your document as an outline can be useful. If you want to make the best use of the outlining features, it pays to set up your document using the Outline view from the start. If you want to sort by heading, make sure the word you want to sort on comes first in each heading. In addition, you can sort on dates or numbers that are contained anywhere in the heading by selecting one of those data types from the Sort Text dialog box's Type drop-down list.

```
@ECHO OFF
CHKDSK1.EXE %1 %2 %3 %4 %5 %6 %7 %8 %9
ECHO <ESC>[2A<ESC>[K
ECHO <ESC>[2A<ESC>[K
ECHO <ESC>[2A<ESC>[K
ECHO <ESC>[2A<ESC>[K
ECHO <ESC>[2A<ESC>[K
```

FIGURE 1: STIFLE CHKDSK'S ANNOYING SCANDISK MESSAGE with ANSI.SYS escape sequences.

```
'MAKEESC.BAS: Convert all occurrences of the string
'  "<ESC>" in the input file to an escape character
'  (ASCII 27). The conversion is case-sensitive;
'  the letters in "<ESC>" must all be uppercase.

ON ERROR GOTO OOPS
INPUT "File to convert: ", I$
IF I$ = "" THEN GOTO DONE
OPEN "I", #1, I$

INPUT "Output file name: ", O$
IF O$ = I$ THEN PRINT "Output file must be different"
        ELSE IF O$ = "" THEN GOTO DONE
END IF

OPEN "O", #2, O$
DO UNTIL EOF(1)
 LINE INPUT #1, L$
 DO
   P% = INSTR(1, L$, "<ESC>")
   IF P% < 1 THEN EXIT DO
   L$=LEFT$(L$,P%-1)+CHR$(27)+RIGHT$(L$,LEN(L$)-P%-4)
 LOOP
PRINT #2, L$
LOOP
DONE: CLOSE
SYSTEM
OOPS: PRINT "Error accessing file": GOTO DONE
```

FIGURE 2: USING MAKEESC.BAS, CONVERT THE STRING '<ESC>' into an Escape character wherever it occurs in a text file.

Enough About ScanDisk Already!

CHKDSK is a useful program, but if you run it in DOS 6.2 or later, you're probably tired of seeing the nagging message that tells you to run SCANDISK instead. Here's a batch file [**FIGURE 1**] that gets rid of the message, provided that you have ANSI.SYS installed. Note that you must insert an Escape character (ASCII 27) everywhere you see '<ESC>' in the listing. [See the editor's note for information on how to do this.] Save the batch file as **CHKDSK.BAT** in your DOS directory, and rename CHKDSK.EXE as **CHKDSK1.EXE**. The batch file runs CHKDSK, then deletes the annoying message using ANSI escape codes.

Lee Kasner, Palm Harbor, Florida

Editor's note: This batch file shows the usefulness of ANSI.SYS escape sequences. One catch: You must enter the command sequence introducer (CSI)—the Escape character and left square bracket—into the batch file to get it to work. One way to do this is not to type the CSI at all, but to capture it from the output of DOS's CLS command using the command **CLS>CSI.TXT**. The resulting text file will contain the CSI followed by the letters *2J*, which you can delete. (Our thanks and $25 go to Reading, Pennsylvania, reader Jawaad Ahmad for submitting the CLS tip.)

If you'd rather not go to all that trouble, and you'll be creating the file using DOS's EDIT program, enter the Escape character by pressing **<Ctrl>-P<Esc>**. (If you use another text editor, you may need to use a different sequence for entering control characters.) Alternatively, type the lines in Figure 1 into a file called **CHKDSK.TXT** *without* substituting Escape characters for each occurrence of '<ESC>'. Then use the QBASIC program MAKEESC.BAS in **FIGURE 2** (which first appeared in the January 1993 *Dialog Box*) to create CHKDSK-.BAT. To run the program, enter **QBASIC /RUN MAKEESC.BAS** at the DOS prompt, and enter the appropriate input and output file names as prompted. MAKEESC.BAS will seek out the string '<ESC>' and replace it with an Escape character.

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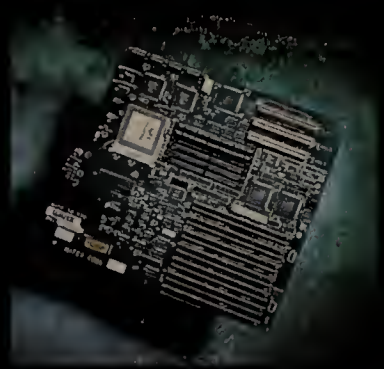

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backups every two or three days. One day I noticed that a single file—386SPART-.PAR—was taking up about 22MB of space on the backup tape, not to mention a whole lot of time to back up!

As you've mentioned previously, the file 386SPART.PAR is Windows' permanent swap file, used only to create virtual memory in 386-enhanced mode. Since the swap file just contains random pieces of programs and data swapped out of memory to disk when Windows runs short of RAM, there's no point in backing it up. So I changed the default settings on my backup program to make it exclude that file. Now my backups go faster and use much less space.

Kalman J. Lester, Fort Lauderdale, Florida

Editor's note: Many users never realize that backups can slow down—and tapes can run out of space—because you're backing up unnecessary files. If you do a file-by-file backup, make sure you exclude the Windows swap file and anything with a TMP extension. If you back up image files, try moving your Windows swap file to its own disk partition and not backing up that partition. (This method has the added advantage of protecting your other files if Windows runs amok and trashes the volume containing the swap file.)

Telltale Times

In "OS/2 for Windows" (*Star-Dot-Star*, July 1994), you mentioned that you must replace certain Windows 3.11 files with their version 3.1 equivalents if you want to run version 3.11 under OS/2 for Windows. You also said that the older and newer versions could be distinguished by their year of creation. This works if you know the year in which each version came out (and if they came out in different years). But there's a better way: Like many companies, Microsoft uses the creation times of files to identify the version of the product they came from. In the case of Windows, files from version 3.1 have a creation time of 3:10 a.m., while files from 3.11 have a creation time of 3:11 a.m. Software manufacturers that use this system (as Microsoft does for some but not all of its products) make it a lot easier to differentiate between program versions.

Ken Whiton, Jaffrey, New Hampshire

Editor's note: Many other companies, including Quarterdeck, Borland, and Word-

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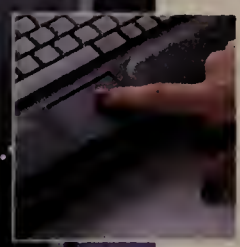

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Perfect, use this same technique to identify versions of their products. However, companies that begin shipping slightly modified versions of a product without announcing a change—a practice called *slipstreaming*—often keep the same time stamp. Therefore, you may still need to look at the displayed version number (or at the file date) to be sure you know what version you're using. In general, it's best to look at the EXE file, since the manufacturer may not update the creation date or time of other files in the package, such as fonts, in each revision.

A Fix for Flawed Serial Chips

Some Pentium-based PCs will hang while using communications programs—including the Microsoft at Work fax program, Windows Terminal, and the communications portion of Microsoft Works for Windows—due to a bug in Intel-manufactured motherboards. The universal asynchronous receiver-transmitter (UART) chip, which is supposed to emulate a National Semiconductor 16C550 UART, actually behaves differently. You can get a new driver for Windows for Workgroups that fixes this problem; download WG1001.EXE from the Microsoft Download Service at 206/936-6735. It contains a new driver called SERIAL.386 that solves the problem.

Cy Tymony, Hawthorne, California

Editor's note: Though this lockup problem does occur on some Intel-made Pentium motherboards, the glitch is caused by an I/O chip made by Standard Microsystems Corporation (SMC). This chip is supposed to contain two 16C550-compatible serial ports, but the ports aren't quite compatible; under certain conditions, they make the computer think it's receiving an endless stream of "garbage" characters. This can cause the whole PC to lock up when you run communications software or start up Windows for Workgroups. A similar problem occurs under Windows 3.1. Both Gateway and Dell have sold Pentium-based PCs with the problematic SMC UART chip.

To download the patch, dial into Microsoft's BBS or look for it on CompuServe (GO MSL). You can also find fixes for Windows 3.1 (a file called W31COM.EXE, containing a new COMM.DRV) and Windows for Workgroups (a file called SER386.EXE, containing Microsoft's new SERIAL.386) on Gateway's bulletin board service at 800/846-7562. If you experience the same kind of trouble with a DOS communications product, try downloading DOSCOM-.EXE from the Gateway BBS.

L-ish Mistake

In "Eat Your Serial (Number)" (*Star-Dot-Star*, August 1994), you printed an assembly language listing for a program intended to alter a disk's volume serial number. I created the file, but it doesn't work; a friend had similar results. I've sent a copy of my file. Can you tell me what went wrong?

Richard J. Hofer, Phoenix

Editor's note: Like approximately a dozen other readers who contacted us, you made a slight transcription error when you copied the file: In the line 'ECHO F 126 l 5 0 >> SNO.SCR', you substituted the numeral 1 for a lowercase *L*. (The *L* indicates that the number 5 is the length, in bytes, of an area in memory that DEBUG is instructed to fill with zeros.) In the future, we'll be sure to capitalize the letter *L* when necessary to distinguish it from the numeral 1. We've also begun printing listings with the background behind alternate lines tinted different colors. This will prevent the most common transcription errors: omitting a blank line, or adding one where it doesn't belong.

By Brett Glass

Brett Glass is a contributing editor for PC World. Star-Dot-Star *welcomes your tips, macros, batch files, and short programs (see page 12 for contact information).*

POWERTIP no. 314

Minimize CorelDraw Redraws

Although CorelDraw 3.0 is faster than its predecessors, it can still be a slug when redrawing a page, especially if the page is packed with detailed (and big) bit maps and EPS files. The antidote? Once you've figured out where to place a bit map, move it off screen until you're ready to finish the document. The image will be saved with your file, but Corel won't redraw it every time you fuss with the page.

Robert Luhn
Albany, California

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PC/Computing
Direct Top 60, July 1994

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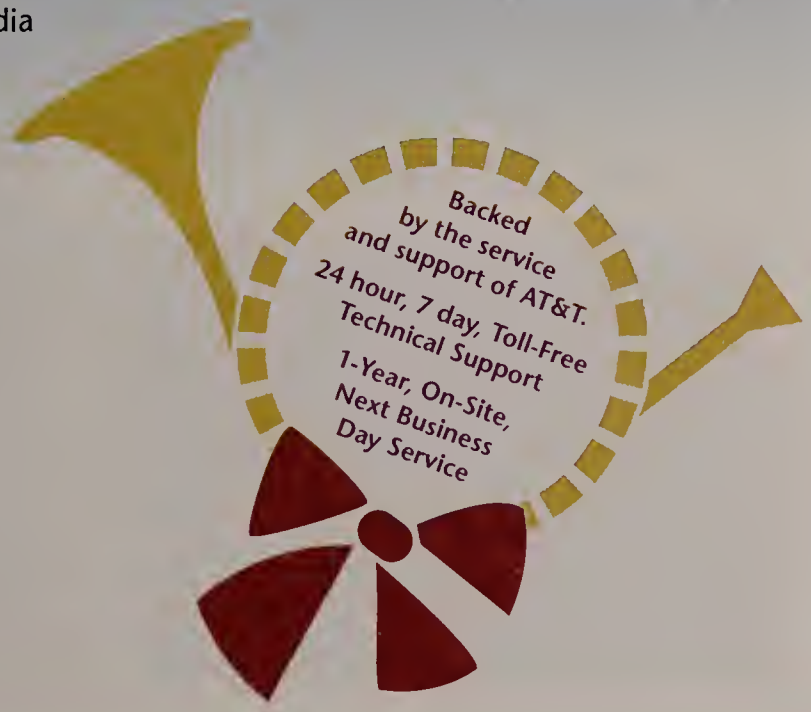

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25705	WordPerfect for DOS & File Server	Wordperfect	DK 3.5"	$324
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Spreadsheet				
59443	Excel 5.0 Win	Microsoft	DK 3.5"	$309
76999	Quattro Pro 5.0 Win	WordPerfect	DK 3.5"	$ 51
26586	Lotus 1-2-3 5.0 Win	Lotus	DK 3.5"	$319
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64678	Harvard Graphics 3.0 Win	SW Publishing	DK 3.5"	$287
42968	PowerPoint 4.0 Win	Microsoft	DK 3.5"	$309
34713	Publisher 2.0 Win	Microsoft	DK 3.5"	$ 87
50948	Freelance Graphics 4.0	Lotus	DK 3.5"	$318
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Database				
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24272	Paradox 4.5 Win	Borland	DK 3.5"	$348
63822	Approach 3.0	Lotus	DK 3.5"	$ 99
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46397	Procomm Plus 2.0 Win	Data Storm	DK 3.5"	$130
02086	WinFax Pro 4.0	Delrina	DK 3.5"	$ 79
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69400	LapLink 6.0 Win	Traveling	DK 3.5"	$129
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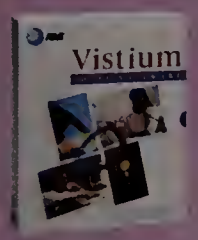

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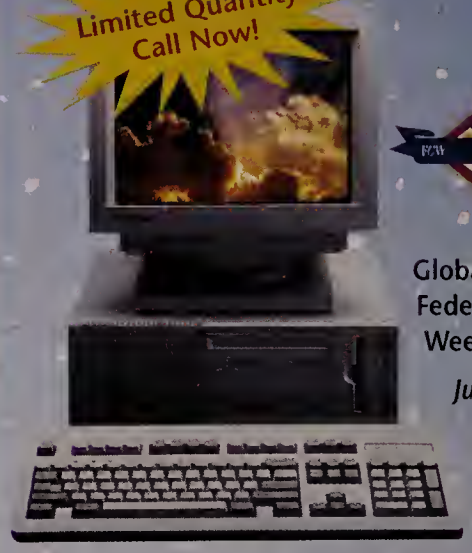

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ADDRESSING E-MAIL FROM ONLINE SERVICES AND THE INTERNET

Many online services, mail services, and corporate mail systems allow users to send E-mail to users of other services and systems. Enter an E-mail address in the formats shown below in the mail address box or prompt of the service from which you're sending a message. Some services may block messages sent via the Internet. E-mail sent via an X.400 link is always faster, more reliable, more private, and less expensive (if not free).

Note: Standard elements in a particular address format are shown here in **boldface**. Elements you must provide, such as the user name of an E-mail recipient, are shown in *italic*.

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To AppleLink	*username***@apple**
To AT&T Mail	*userID***@att**
To CompuServe	*numericID***@cis** (use period in place of comma in *numericID*)
To Delphi	*userlogon***@delphi.com**
To GEnie	*userlogon***@genie**
To MCI Mail	*numericID***@mci**
To Prodigy	*username***@prodigy.com**
To SprintMail	*userID***@sprint.com**

Fold Here

FROM APPLELINK

To America Online	*username***@aol.com**
To AT&T Mail	*userID***@attmail.com**
To CompuServe	*numericID***@compuserve.com** (use period in place of comma in *numericID*)
To Delphi	*userlogon***@delphi.com**
To GEnie	*userlogon***@genie.geis.com**
To MCI Mail	*numericID***@mcimail.com** (omit hyphen in *numericID*)
To Prodigy	*userID***@prodigy.com**
To SprintMail	*userID***@sprint.com**

FROM AT&T MAIL

To America Online	**internet!aol.com!***username*
To AppleLink	**internet!applelink.apple.com!***username*
To CompuServe	**mhs!csmail/dd.id=***numericID* (use period in place of comma in *numericID*)
To Delphi	**internet!delphi.com!***userlogon*
To GEnie	**internet!genie.geis.com!***userlogon*
To Message Handling Service hub-linked E-mail system	**mhs!***gatename***/pn=***firstname_lastname***/dda.id=***numericID*
To MCI Mail	**mhs!mci/pn=***firstname_lastname***/dda.id=***numericID*
To Prodigy	**internet!prodigy.com!***username*
To SprintMail	**mhs!***gatename***/pn=***firstname_lastname***/dda.id=***userID*

FROM COMPUSERVE

Note: DOSCIM and WinCIM users sending messages through the Internet should preface the recipient's address with **Internet:** (omit >).

To America Online	**>Internet:***username***@aol.com**
To AppleLink	**>Internet:***username***@applelink.apple.com**
To AT&T Mail	**x400:(c=us; a=attmail; s=***surname***; g=***networkname***; d=id:***networkID***)**
To Delphi	**>Internet:***userlogon***@delphi.com**
To GEnie	**>Internet:***userlogon***@genie.geis.com**
To MCI Mail	**MCIMAIL:***numericID*
To Message Handling Service hub-linked E-mail system	**MHS:***firstname.lastname***@***companyname*
To Prodigy	**>Internet:***username***@prodigy.com**
To SprintMail	**x400:(c=us; a=telemail; o=***organization***; s=***surname***; g=***given***; d=id:***userID***)**

Fold Here

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To AppleLink	**mail@cserve{Internet:***username***@applelink.apple.com}**
To AT&T Mail	**mail@cserve{X400:(c=us; a=attmail; d=id:***username***)}**
To Delphi	**mail@cserve{Internet:***userlogon***@delphi.com}**
To GEnie	**mail@cserve{Internet:***userlogon***@genie.geis.com}**
To MCI Mail	**mail@cserve{X400:(c=us; a=mcimail; d=id:***username***)}**
To Message Handling Service hub-linked E-mail system	**mail@cserve{Internet:***username***@***company***.com}**
To Prodigy	**mail@cserve{Internet:***username***@prodigy.com}**
To SprintMail	**mail@cserve{X400:(c=us; a=telemail; o=***organization***; s=***surname***; g=***given***; d=id:***userID***)}**

FROM DELPHI

To America Online	**Internet"***username***@aol.com"**
To AppleLink	**Internet"***username***@applelink.apple.com"**
To AT&T Mail	**Internet"***userID***@attmail.com"**
To CompuServe	**Internet"***numericID***@compuserve.com"** (use period in place of comma in *numericID*)
To GEnie	**Internet"***userlogon***@genie.geis.com"**
To MCI Mail	**Internet"***numericID***@mcimail.com"** (omit hyphen in *numericID*)
To Prodigy	**Internet"***userID***@prodigy.com"**
To SprintMail	**Internet"***userID***@sprint.com"**

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For use with PC World Instant Reference Card Portfolio

ADDRESSING E-MAIL FROM ONLINE SERVICES AND THE INTERNET

FROM GENIE

To America Online	*username*@**aol.com@inet#**
To AppleLink	*username*@**applelink.apple.com@inet#**
To AT&T Mail	*userID*@**attmail.com@inet#**
To CompuServe	*numericID*@**compuserve.com@inet#** (use period in place of comma in *numericID*)
To Delphi	*userlogon*@**delphi.com@inet#**
To MCI Mail	*numericID*@**mcimail.com@inet#** (omit hyphen in *numericID*)
To Prodigy	*userID*@**prodigy.com@inet#**
To SprintMail	*userID*@**sprint.com@inet#**

FROM MCI MAIL

To America Online	To: *firstname lastname* **(ems)** EMS: **internet** MBX: *username*@**aol.com**
To AppleLink	To: *firstname lastname* **(ems)** EMS: **internet** MBX: *username*@**applelink.apple.com**
To AT&T Mail	To: *lastname* **(ems)** EMS: **attmail** MBX: **GI=***firstname* MBX: **DDA=ID=***username*
To CompuServe	To: *lastname* **(ems)** EMS: **compuserve** MBX: **P=CSMAIL** MBX: **DDA=ID=***numericID*
To Delphi	To: *firstname lastname* **(ems)** EMS: **Internet** MBX: *userlogon*@**delphi.com**
To GEnie	To: *firstname lastname* **(ems)** EMS: **internet** MBX: *userlogon*@**genie.geis.com**
To Prodigy	To: *firstname lastname* **(ems)** EMS: **Internet** MBX: *username*@**prodigy.com**
To SprintMail (TeleMail)	To: *firstname lastname* **(ems)** EMS: **telemail** MBX: **DDA=ID=***recipientID*

FROM PRODIGY

Note: Sending E-mail to another service requires Prodigy's Mail Manager software. While online, click *Jump* and type **Internet**.

To America Online	*username*@**aol.com**
To AppleLink	*username*@**applelink.apple.com**
To AT&T Mail	*userID*@**attmail.com**
To CompuServe	*numericID*@**compuserve.com** (use period in place of comma in *numericID*)
To Delphi	*userlogon*@**delphi.com**
To GEnie	*userlogon*@**genie.geis.com**
To MCI Mail	*numericID*@**mcimail.com** (omit hyphen in *numericID*)
To SprintMail	*userID*@**sprint.com**

FROM SPRINTMAIL

To America Online	*username*@**aol.com**
To AppleLink	*username*@**applelink.apple.com**
To AT&T Mail	*userID*@**attmail.com**
To CompuServe	*numericID*@**compuserve.com** (use period in place of comma in *numericID*)
To Delphi	*userlogon*@**delphi.com**
To GEnie	*userlogon*@**genie.geis.com**
To MCI Mail	*numericID*@**mcimail.com** (omit hyphen in *numericID*)
To Prodigy	*userID*@**prodigy.com**

FROM INTERNET

To America Online	*username*@**aol.com**
To AppleLink	*username*@**applelink.apple.com**
To AT&T EasyLink Mail	*address*@**eln.attmail.com**
To AT&T Mail	*userID*@**attmail.com**
To BITNET	*address*.**bitnet**
To CompuServe	*numericID*@**compuserve.com**
To CONNECT	*username*@**dcjcon.das.net**
To Delphi	*userlogon*@**delphi.com**
To FidoNet	*username*@**f***nodenumber.network number*.**z***zonenumber*.**fidonet.org**
To GEnie	*userlogon*@**genie.geis.com**
To MCI Mail	*userID*@**mcimail.com**
To CompuServe-linked network	*username*@*companyname*.**mhs.compuserve.com**
To Prodigy	*userID*@**prodigy.com**
To SprintMail	*userID*@**sprint.com**
To UUNET	*user*%*organization.domain*@**uunet.uu.net**

FROM AN INTERNET LINKED E-MAIL SYSTEM

To America Online	*username*@**aol.com**
To AppleLink	*username*@**applelink.apple.com**
To AT&T Mail	*userID*@**attmail.com**
To CompuServe	*numericID*@**compuserve.com** (use period in place of comma in *numericID*)
To Delphi	*userlogon*@**delphi.com**
To GEnie	*userlogon*@**genie.geis.com**
To MCI Mail	*numericID*@**mcimail.com** (omit hyphen in *numericID*)
To Prodigy	*userID*@**prodigy.com**
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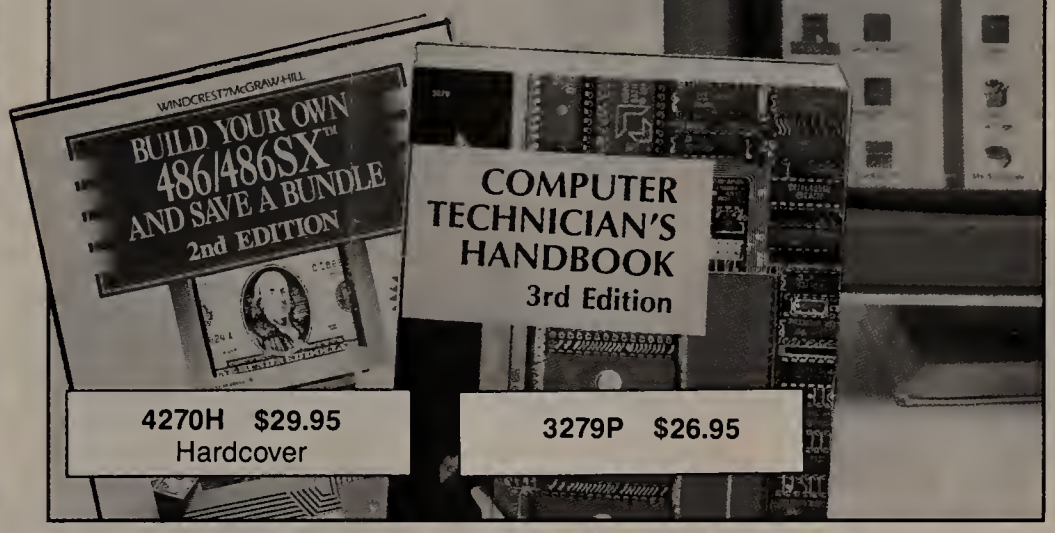

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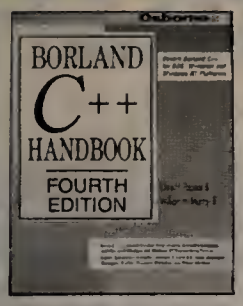

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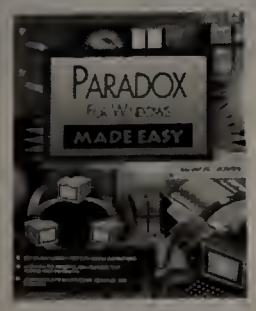
3049P-XX $29.95
Counts as 2



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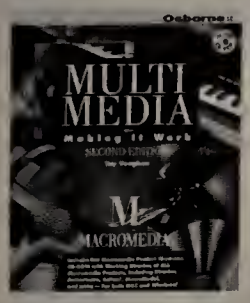

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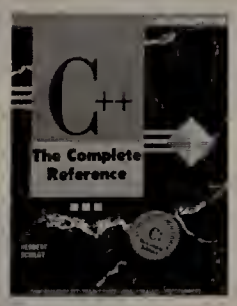

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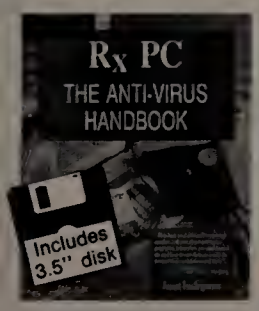

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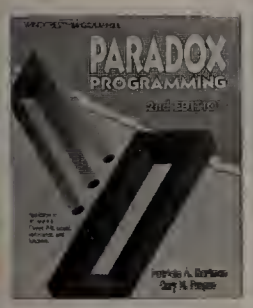

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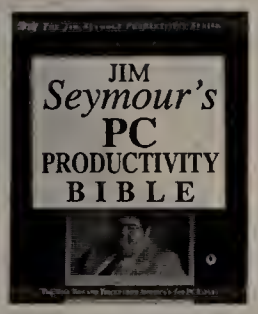

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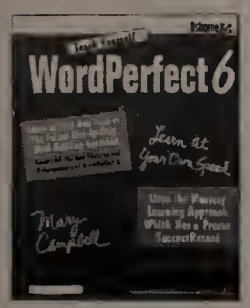

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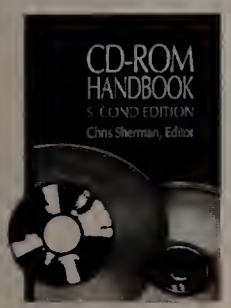

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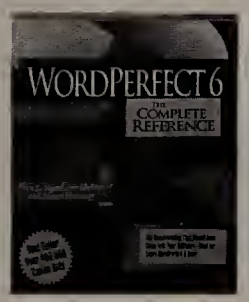

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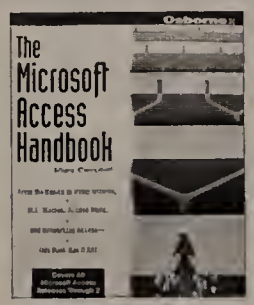

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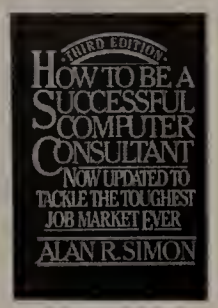

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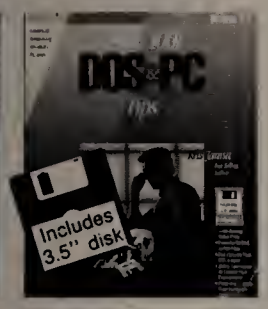

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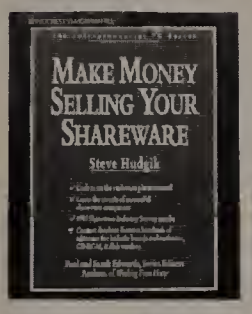

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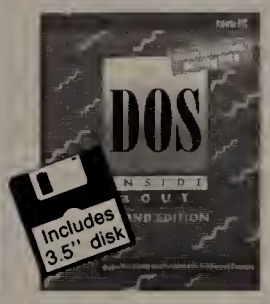

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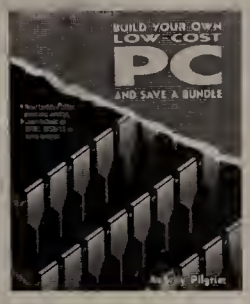

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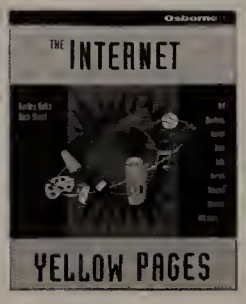

8820235 $27.95

881907-XX $29.95
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8818346-XX $39.95
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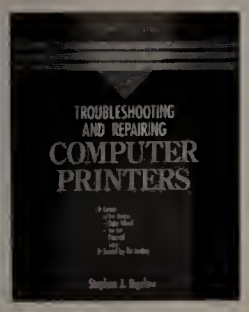
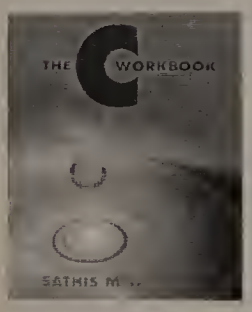


3923P $24.95



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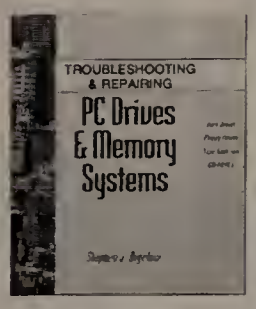

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Hardcover

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MULTIMEDIA WORLD
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The next time you call information for a listing, try asking the operator to give you the *neighbors* of that person. Or if you're getting a business listing, like a dry cleaner, ask for a list of *all* the dry cleaners in your city. It's not too likely he or she will provide you with that information. So imagine the possibilities when you start working with Select Phone, the amazing Phonebook on CD-ROM. All of a sudden *you're in control!* With lightning speed, you can now access 80 million telephone directory listings all across the country. By yourself. Right from your CD-ROM drive.

Find old friends—track down new prospects.

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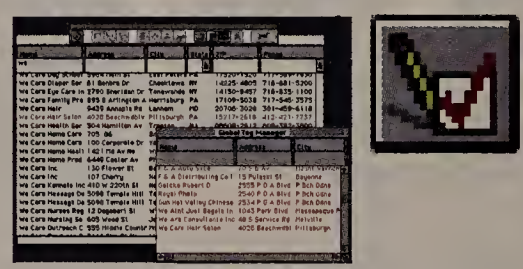
Custom search to match your exact specs.

When you open up Select Phone, you're offered eight different ways to locate someone. For simplicity, you only need to type in someone's name. If you don't know the full name, just type in a part of it and do what's called a *wild card search.* Let's say you can only remember the name was something like "Down." Type in DOWN* and you'll get all the Downs, Downes, Downeys, etc. Now use this incredibly powerful search function for your business. Say you're in Fargo and you sell products to a specific type of company, like dry cleaners. You just type in Fargo and "dry cleaner" or the SIC code and with a click bring up all the dry cleaners in Fargo (there are five).



Tag listings then download them to your own database, contact manager or word processor and move your business into high gear.

O.K. So it can search and find people. But you're in business to make money.

Picture a Phonebook on steroids.

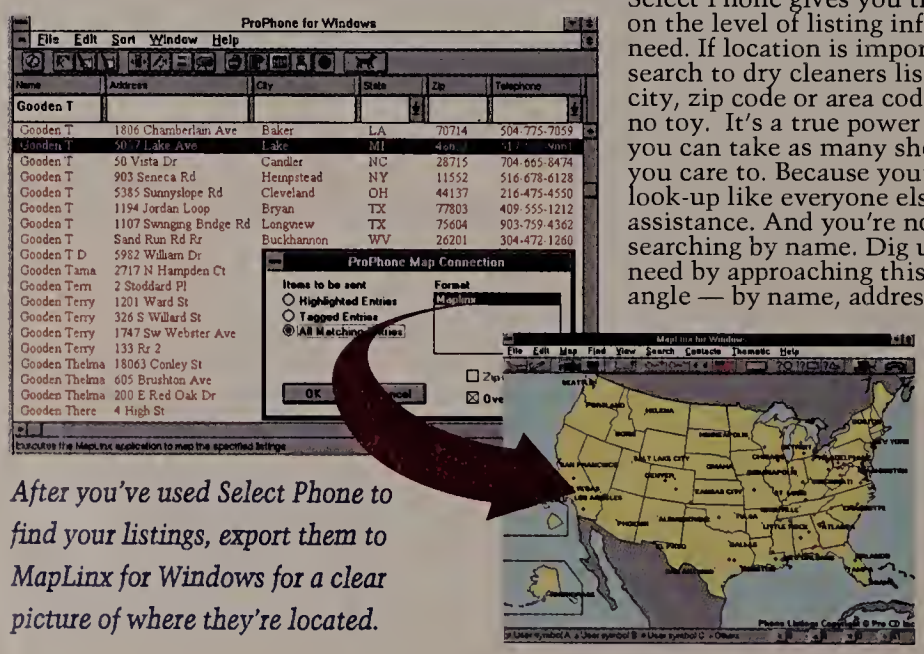
If you think of this CD-ROM as mere telephone listings in another format, you've only got one toe in the water. Its search and retrieval powers alone make it more akin to the radar screen on a nuclear submarine. It offers so many ways to compile listings that your list brokers may soon be reworking their resumes.

Turn listings into gold.

For their search and retrieval benefits alone you'll want to grab hold of these CD-ROM disks and weld them to your desktop. But they offer even more amazing features—some that boggle the mind. OK, so now you're selling flowers wholesale and need a count of all the florists in Maryland. No problem. Key in "florist" under business type and click on the little meter icon. There they are (all 289). Tag them. Now — hold on tight — download them to your own database, contact manager or word processor and move your business into high gear.

You can even count them.

Select Phone gives you the ability to zero in on the level of listing information you most need. If location is important, narrow your search to dry cleaners listed within a state, city, zip code or area code. It's obvious this is no toy. It's a true power tool. And best of all, you can take as many shots at searching as you care to. Because you're not paying per look-up like everyone else who uses directory assistance. And you're not limited to just searching by name. Dig up all the listings you need by approaching this directory from any angle — by name, address, city, state, zip code, area code — even business heading. Heady stuff! It's like going from being a speck under a microscope to being the scientist looking into the lens. Except now your finger's on the focus knob.



After you've used Select Phone to find your listings, export them to MapLinx for Windows for a clear picture of where they're located.

30 DAY MONEY BACK GUARANTEE

30-DAY GUARANTEE

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Look up, find, locate, call, download, map and mail millions of telephone directory listings.

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Click on the door icon for a listing of neighbors or even occupants of the same building.

Click on the head icon to sort listings by name.

Click on the printer icon to print tagged listings.

Click on the meter icon to get counts of a particular listing type.

Click on the globe icon to see tagged listings in MapLinx for Windows.

Click on the CD-ROM icon to choose which of Select Phone's five-disc set you want.

Click on the checkmark icon to tag and untag listings that meet your search criteria.

Click on the # icon to order listings by phone number.

Click on the mail box icon to sort listings by ZIP + 4 address.

Click on the arrow icon to export listings to ASCII, database, word processor, or contact management software.

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database or contact manager for a print out (that's right — like ACT!, Sharkware, Telemagic or Maximizer to name a few). Try a mail campaign. Generate sales leads. Even add phone numbers to those bingo cards you got from your last ad.

And this next feature is a killer. Say you're working a neighborhood or an office building with some great customers. You know their neighbors would be great prospects, too. You key in a good customer's name. Click on the little red door icon. Ding-dong. There's a hot new prospect list sitting on your desk. Can't quite see it yet?

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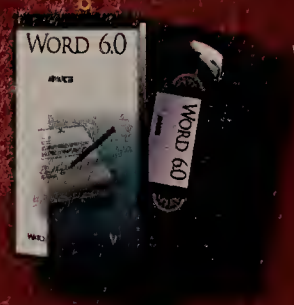

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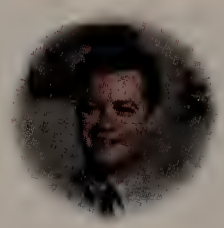

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Premium 386/33TE, 486/25TE, 33TE			
Prem. Serv., Prem II 386SX/20, 25			
Prem. II 386/25, 386/33, 486/33, 486SX/20	8Meg	500780-001 (64 pin)	398.00
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Prem. II 386SX/20, 25	4Meg	500780-004 (64 pin)	189.00
Premium 386/25, 33, 386/33T, 386SX/16,	1Meg	500780-003 (64 pin)	59.00
Prem. II 386SX20,25	1Meg	500780-001 (64 pin)	59.00
Premia 4/33S, 4/33, 4/500, 4/660	8Meg	501159-002	379.00
Premia	16Meg	501159-003	789.00
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AST Cupid 8d	0–32Meg	500818-001	179.00

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6450604/92G7196 (2Meg)	79-061, E61, 121, 50Z, 55SX, 65SX, P-70, 55LS, 65LS, X-Station 120 & 130, 35SX, 35LS, 40SX	99.00
6450608 (2Meg)	70-A21, A-61, 8-21, 8-61, 355X, 35LS, 40SX, Val Pt. 325T	90.00
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92G7201, 73G3131 (4Meg)	Value Point Performance, PC Server 4/66	175.00
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6450902 (2Meg)	56, S7, 57SX,90, 95, P-75, 57SLC	90.00
6450128/92G7200 (4Meg)	Value Point 77 486DX2, 486SX, SVR 85 57SX, 90, 95, P-75, 57SLC, 56, 56SLC, P/S1, 3865X, Mod-2123, 2133, 2155, Val Pt 77, 486CS2, 486SX, SVR85 Value Point 77 486DX2, 486SX, SVR 85	175.00
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	8Meg Module	116561-001	399.00
	32Meg Module	116568-001	1399.00
OeskPro 386/33L, 486/33L	(Exp 8d)	116569-001	279.00
OeskPro 386/25, 386/20	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
OeskPro 386S-16MHz	1Meg Exp 8d	113633-001	149.00
	4Meg Exp 8d	113634-001	279.00
	1Meg Module	113646-001	79.00
	4Meg Module	112534-001	199.00
OeskPro 386/20E	1Meg Exp 8d	113644-001	149.00
OeskPro 386/25E	4Meg Exp 8d	113645-001	279.00
	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
OeskPro 286N, 386N, 386SX20, all "M" series, sytem LT series, all "I" series	1Meg Module	118688-001	59.00
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M Series Exp 8d	0-64Meg	129160-001	189.00
OeskPro 386/16	1Meg Kit	108071-001	99.00
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OeskPro 286	512K Kit	113012-001	49.00
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T2000SXE/2200SX/T1800, 18SD, C	2Meg	PC-PA2000U	89.00
T2000SXE/2200SX/T1800, 18SD, C	4Meg	PC-PA2001U	189.00
T2000SXE/2200SX/T1800, 1850, C	8Meg	PC-PA2002U	359.00
T4400SX, SXC T6400, T6600	4Meg	PC-PA2004U	189.00
T4400SX, SXC T6400, T6600	8Meg	PC-PA2005U	359.00
T4400SX, SXC T6400, T6800	16Meg	PC-PA2010U	699.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	4Meg	PC-PA2012U	209.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	8Meg	PC-PA2013U	389.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	16Meg	PC-PA2014U	769.00
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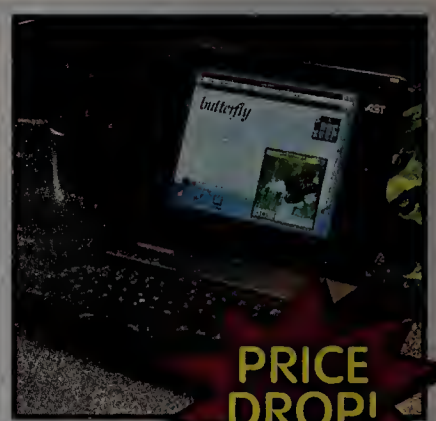

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ML590 ..... 429.51
ML591 ..... 579.86
Pacemark 3410 ..... 1219.49
OL400E* 422.70
OL410E 647.84
OL410E/PS 4ppm 600dpi 919.15
OL810 ..... 905.50

*includes $75 manufacturer rebate (ends 12/31/94)

Canon

BJ10SX 244.88
BJ200E 259.44
BJ230 ..... 388.00
BJC600 color 499.00
BJC4000 720dpi + color 465.38
LBP430 300dpi 4ppm laser 579.00
LBP860 600dpi 8ppm laser 986.93

EPSON

AP2250 ..... 96.55
AP3250 ..... 146.31
AP3260 ..... 167.82
LX300 ..... 165.01
FX870 ..... 269.46
FX1170 ..... 359.00
AP5000+ 229.71
LO1070+ 365.35
LO870 ..... 454.44
LO1170 ..... 597.99
LO2550 ..... 898.08
DFX5000 Plus 1354.86
DFX8000 ..... 2259.45
Stylus 300 ..... 186.85
Stylus 400 ..... 198.70
Stylus 800+ 209.88
Stylus Color 509.53
ActionLaser 1100 ..... 429.79
ActionLaser 1500 ..... 529.85
ActionLaser 1600 ..... 757.45

IBM LEXMARK LASER PRINTERS

WinWriter 100 inkjet 287.67
WinWriter 200 laser 457.57
WinWriter 400 laser 758.47
WinWriter 600 laser 999.00
ValueWriter 300 (4037 5E 5PPM) 647.17
ValueWriter 600 laser 815.87
Optra R 600dpi laser 1429.97
ExecJet IIc 327.60

Digital Corporation

DECwriter 500i inkjet 357.00
Color upgrade for 500i 41.00
DEClaser 1152 4 ppm 659.75
DEClaser 5100 8 ppm 1439.86

Panasonic

1150 ..... 133.49
1624 ..... 385.20
2023 ..... 182.27
2130* 174.40
2135 Color** 197.43

after $30* or $50* mail-in rebate (ends 12/31/94)

2624 ..... 409.49
3123 ..... 249.00
4400 Laser* 399.89
5400 Laser** 712.98

after $50* or $100* mail-in rebate (ends 12/31/94)

TEXAS INSTRUMENTS

microMarc Color inkjet 334.76
microWriter basic 485.61
microWriter PS23 ..... 639.65
microLaser Pro 600 PS23 ..... 1197.02
microLaser Pro 600 PS65 ..... 1524.25
microLaser Pro E 1395.49
microLaser Power Pro 600 PS65 ..... 1629.60

HEWLETT PACKARD

DeskJet 500C 299.99
DeskJet 540 ..... 289.75
DeskJet 560C 479.89
DeskJet 1200C 1347.91
DeskJet 1200C PS 1989.11
LaserJet 4L 669.56
LaserJet 4P 959.47
LaserJet 4MP 1387.21
LaserJet 4 plus 1478.25
LaserJet 4M plus 1988.72
LaserJet 4SI 2998.95
LaserJet 4SI MX 4399.89

COSTAR

LabelWriter XL DOS/Win 144.46
LabelWriter XL Plus DOS/Win 224.89

HARD DRIVES & CONTROLLERS

Maxtor

170MB IDE 157.07
270MB IDE 177.90
345MB IDE 199.77
345MB SCSI 225.55
540MB IDE 284.44

MICROPOLIS

2210A 1050MB IDE 734.97
2210 1050MB SCSI 734.97
4110A 1050MB IDE 659.65
4110 1050MB SCSI 626.89
2217 1.7GB SCSI 1038.46
2210AV 1.050GB SCSI AV 798.89
2217AV 1.765GB SCSI AV 1099.22
1936 3GB SCSI 1899.69

CONNER

210MB IDE 177.90
425MB IDE 231.43
540MB IDE 302.24
850MB IDE 439.38
1.27GB IDE 584.83

All Conner drivas listed includa completa installation hardware and software.

Seagate

200MB IDE 173.14
261MB IDE 162.37
341MB IDE 205.91
427MB IDE 224.56
1.0GB SCSI-2 ..... 632.78

WESTERN DIGITAL

Caviar 210MB IDE 175.35
Caviar 420MB IDE 223.03
Caviar 540MB IDE 279.99
Caviar 730MB IDE 317.63
Caviar 1GB IDE 499.98

CONTROLLERS

Acculogic IDE W/1PAR, 2SER, 1GAME 35.06
Acculogic IDE W/BIOS 48.90
Acculogic VLB IDE 89.76
Adaptec AVA1505 SCSI-2 CD KIT 54.95
Adaptec 1542CF SCSI-2 ..... 265.45
Adaptec AVA2825 SCSI-2/EIDE VLB 166.87
Adaptec 2842 VLB SCSI-2 ..... 257.23
Promise DC200 IDE ISA Cache 94.50
Promise DC4030 IDE VLB Cache 115.29
Promise 2300+ EIDE VLB 59.87

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U.S. Robotics

SPORTSTER MODEMS

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V.34 28.8K external w/fax 244.32
14.4K internal w/fax 99.45
14.4K external w/fax 114.79

COURIER MODEMS

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V.34 external w/fax 427.84

Hayes

ACCURA 14.4 internal w/fax 95.93
ACCURA 14.4 external w/fax 116.44
ACCURA 28.8 V.34 internal w/fax 188.13
ACCURA 28.8 V.34 external w/fax 228.44
OPTIMA 14.4 external w/fax 374.30
OPTIMA 14.4 pocket w/fax 296.93
OPTIMA 28.8 V.FC external w/fax 421.54

PRACTICAL PERIPHERALS.

14.4 internal w/fax 89.96
14.4 Mini Tower w/fax 109.02
V.34 28.8 internal w/fax 196.59
V.34 28.8 Mini Tower w/fax 209.64
Practical Pro Series ..... CALL!

intel

SatisFAXtion 200 internal 209.50
SatisFAXtion 400 Super Fax Pack 298.83
SatisFAXtion 400 external 308.89

BOCA

Online Express 14.4 internal w/fax 66.63
Online Express 14.4 external w/fax 79.78
V.34 28.8 internal w/fax 185.34
V.34 28.8 external w/fax 224.30

MICROCOM

Deskporte ES 14.4 ..... 146.39
Deskporte Fast ES V.FC 28.8 ..... 179.94
Deskporte Fast EP V.FC 28.8 ..... 244.30

BATTERY BACKUP AND UPS

American Power Conversion

BackUPS 280 ..... 99.53
BackUPS 400 ..... 159.94
BackUPS 450 ..... 189.99
BackUPS 600 ..... 264.24
BackUPS 900 ..... 374.88
BackUPS 1250 ..... 499.24
SmartUPS 400 ..... 299.69
SmartUPS 600 ..... 363.38
SmartUPS 900 ..... 514.61
SmartUPS 1250 ..... 644.24
SurgeArrest Network 34.97
SurgeArrest Pro 33.58
SurgeArrest Network + Phone 48.65
Line-R 600 ..... 119.09

Tripp Lite

BC250 ..... 96.08
BC400 ..... 155.59
BC500 ..... 189.42
BC500 LAN 198.65
BC600 LAN 249.00
BC750 LAN 313.90
BC900 LAN 359.67
BC1250 LAN 459.10

Tripp Lite Smart UPS Series

SMART 250 LAN 226.81
SMART 400 LAN 279.22
SMART 500 LAN 286.21
SMART 600 LAN 311.26
SMART 750 LAN 379.86
SMART 900 LAN 439.81
SMART 1250 LAN 579.00
Isobar 4 OUTLET 38.95
Isobar 6 OUTLET 46.38

PCMCIA

3Com Etherlink III combo 246.15
DSP Tech Portable Sound+ 154.34
Hayes OPTIMA 14.4 data/fax 189.82
IBM Token Ring 16/4 ..... 412.46
Linksys Ethernet combo 167.56
Maxtor MobileMax 105MB HD 326.31
Megahertz 14.4 data/fax 216.70
Megahertz 14.4 Gold data/fax XJack 229.00
Megahertz V.34 XJack 449.88
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Turtle Beach Audio Advantage 129.38
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Xircom Ethernet 10BT 184.71
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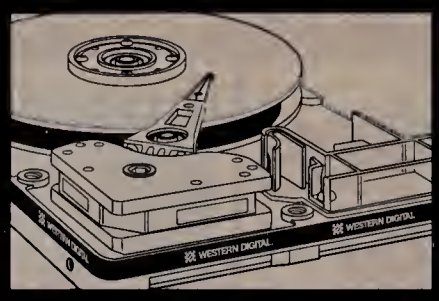

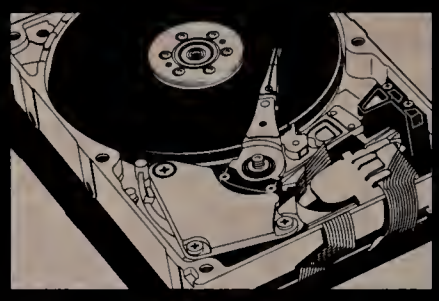

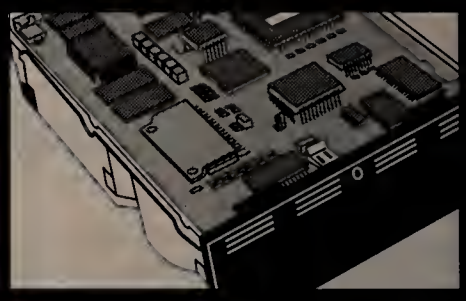

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Nobody knows drives like MegaHaus. We have specialized in storage solutions for over 8 years. Repeat business from satisfied customers is the backbone of our business. We satisfy our customers.

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During the first year of your warranty, we replace: not repair, any defective items. All items receive lifetime technical support from our factory trained techs.

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Anyone can sell you a hard drive. We sell easy to install storage solutions. We spend countless hours researching the best solutions, then create our quick precise installation guides for each kit.

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420MB	12ms	WDAC2420	$197
540MB	12ms	WDAC2540	$233
730MB	10ms	WDAC2700	$289
1083MB	10ms	WDAC31000	$445

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1050MB	IDE or SCSI	8.5ms	MC4110	$539
1740MB	IDE or SCSI	10ms	MC2217	$799
4294MB	SCSI	8ms	MC3243	$2189

Seagate

MegaHaus unbeatable price! WIDE SCSI in stock.

2139MB	8ms	7200rpm	ST12550N	$1199
2148MB	9ms	5400rpm	ST12400N	$1029
4290MB	8ms	7200rpm	ST15150N	$2239
9080MB	10ms	5400rpm	ST410800N	$3339

FUJITSU

JAPANESE QUALITY! INCREDIBLE PRICE!

240MB	2.5"	14ms	IDE or SCSI	1yr wty.	$279
530MB	3.5"	13.8ms	IDE	2yr wty.	$225
530MB	3.5"	13.8ms	SCSI	2yr wty.	$245
1080MB	3.5"	9.5ms	SCSI	5yr wty.	$525

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Run on floppy controller. 1 FREE tape. Save $10 w/ drive sale.

Capacity	Brand	Warranty	Internal	External
250MB	IOMEGA	5yr	$155	$279
420MB	CONNER	2yr	$195	$339
850MB	CONNER	2yr	$289	$429

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External CD ROM changers. No more disc swapping!

6 Disc	Double Speed	DRM602X	$439
6 Disc	Quad Speed	DRM604X	$989
18 Disc	Quad Speed	DRM1804X	$1899

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CONNER

IDE

210MB	14ms	CFS210A	$166
420MB	14ms	CFS420A	$205
850MB	10ms	CNR850A	$419
1275MB	9ms	CNR1275A	$539

Maxtor

IDE

135MB	12ms	M7135AV	$139
270MB	12ms	M7270AV	$162
420MB	12ms	M7420AV	$198
540MB	12ms	M7540AV	$245

MICROPOLIS

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1050MB	10ms	MC4110A	$539
1740MB	10ms	MC2217A	$799

SCSI

1052MB	8.5ms	MC4110	$539
1740MB	10ms	MC2217	$799
2050MB	8.5ms	MC4221	$1325
3020MB	11ms	MC1936	$1659
4294MB	8ms	MC3243	$2189
9100MB	12ms	MC1991	$3459

SCSI-AV Audio / Visual tuned drives

1000MB	10ms	MC4110AV	$639
1700MB	10ms	MC2217AV	$989
2000MB	8.5ms	MC4221AV	$1469
3000MB	11ms	MC1936AV	$1699
4294MB	8ms	MC3243AV	$2359
9100MB	12ms	MC1991AV	$3499

Seagate

IDE

260MB	16ms	ST3290A	$155
420MB	14ms	ST3491A	$199
545MB	12ms	ST5660A	$259
722MB	12ms	ST3780A	$325
1083MB	12ms	ST31220A	$485

SCSI (WIDE SCSI also available)

1052MB	9ms	ST31200N	$569
1700MB	9ms	ST11900N	$1019
2145MB	8ms	ST12550N	$1199
2148MB	9ms	ST12400N	$1029
4290MB	9ms	ST15230N	$1979
4290MB	8ms	ST15150N	$2239
9080MB	11ms	ST410800N	$3339

HARD DRIVES

Quantum

IDE

270MB	14ms	MV270A	$169
365MB	11ms	LT340A	$188
541MB	11ms	LT540A	$235
731MB	11ms	LT730A	$295

SCSI

270MB	14ms	MV270S	$185
342MB	12ms	LPS340S	$215
540MB	14ms	MV540S	$242
541MB	11ms	LT540S	$249
731MB	11ms	LT730S	$325
1080MB	10ms	IMP1080	$549
1440MB	9.5ms	IMP1440S	$699
2160MB	9.5ms	IMP2160S	$959
4280MB	8.6ms	GP4280S	$2399

IBM

IDE

364MB	12ms	70G8488	$195
527MB	12ms	70G8486	$259
728MB	12ms	70G8511	$329
1052MB	8.6ms	70G8512	$579

SCSI (WIDE SCSI also available)

728MB	12ms	94G2422	$359
1052MB	8.6ms	70G8492	$609
2040MB	9.2ms	70G8493	$1149
4250MB	11ms	90F0780	$2179

SYQUEST SALE!

SCSI		Drive	PC Kit	Mac Kit
44/88MB	SQ5110C	$249	$379	$399
105MB	SQ3105S	$229	$349	$339
200MB	SQ5200C	$389	$549	$519
270MB	SQ3270S	$369	$519	$489

IDE		Drive w/1 disk	PC Kit	Portable
105MB	SQ3105A	$179	$269	$339
270MB	SQ3270A	$339	$439	$529

Cartridges Qty 2-4 / 5-9 / 10+ or with drive
44MB 66/61/57 88MB 70/66/64 105MB 56/54/53
200MB 83/77/75 270MB 65/62/59

MISCELLANEOUS

WIDE SCSI, Macintosh Drives, Power Mac Drives, Hard Disk Cards, PCMCIA Drives, 2 1/2" Drives, Floppy Drives, IBM PS/1, PS/2, and Tandy Drives.

CD ROM DRIVES

SCSI

Toshiba	XM3501	4X	120ms	$359
Plextor	PX43CH	4X	150ms	$449
NEC	CDR510	3X	195ms	$279
Toshiba	XM3401	2X	200ms	$255
Sanyo	SH93R	2X	280ms	$149

IDE (ATAPI)

Mitsumi	CRMCFX400	4X	230ms	$249

MULTIMEDIA KITS

SCSI Drive, sound card (in retail pkg)
PREM=Media Vision Premium 3D. PRO=Media Vision Pro 3D
SB= Sound Blaster 16 SCSI. SA= Sound Blaster SCSI ASP.

	PREM	PRO	SB	SA
SH93R	$289	$409	$289	$349
XM3401	$425	$549	$425	$479
CDR510	$449	$569	$449	$499
XM3501	$569	$689	$569	$629
PX43CH	$599	$729	$599	$669

CONTROLLER CARDS

ADAPTEC	Alone	w/Drive
A1522BASIC 16Bit SCSI	$129	$109
A1542CBASIC 16Bit SCSI	$225	$215
A2742 EISA SCSI	$379	$369
A2842 VESA SCSI	$259	$249
A2940Kit PCI SCSI	$299	$289
Future Domain 1680 16Bit SCSI	$134	$119
QLOGIC PCI SCSI & WIDE	$325	$315
TEKRAM CACHING CARDS		
DC600CF 16Bit IDE	$89	$79
DC680C 32Bit Local Bus IDE	$109	$99
DC690C 32Bit PCI IDE	$149	$139
SCSI Controllers include COREL SCSI		
DC800B 16Bit SCSI	$199	$189
DC880B 32Bit Local Bus SCSI	$299	$289
TEKRAM NON-CACHING		
DC300B 16Bit SCSI w/ Corel	$159	$149
DC380B VESA SCSI w/ Corel	$179	$160
DC290N PCI Enhanced IDE	$45	$39
DC200S 16Bit IDE w/ High Speed IO	$55	$45
GSI 16Bit IDE accelerators (enhanced IDE)		
Boost Performance 30 to 80%! VESA coming soon.		
1533-21 2IDE, 4 Floppy	$65	$55
1533-32 2IDE, 4 Floppy, IO	$125	$115
4C 16Bit supports 8 IDE	$139	$129

Many other types of controllers in stock.

SCSI TAPE DRIVES

Kit includes 16bit card, DOS or Windows software & 1 tape.

			Bare	Kit
250MB	Conner	C2150	$349	$509
525MB	Conner	C2525	$479	$639
750-1.5Gig	Exabyte	2501	$499	$649
2Gig	Conner	4320	$749	$849
2Gig	HP	35470	$829	$929
NEW DRIVE! Back-up speed 54MB/min				
2-4Gig	Conner	3200	$589	$699
4-8Gig	Conner	4324	$859	$959
4-8Gig	HP	35480	$929	$1039
4-16Gig	Sony	SDT5000	$899	$1019
4-16Gig	Conner	4326	$959	$1089
4-16Gig	HP	C1533A	$1099	$1219
5-10Gig	Exabyte	8505	$2039	$2209

Backup Software

Novell NLM 50 user / unlimited	$199 / $339
NovaBack OS/2 / Mac	$89 / $109
Retrospect for Mac	$129
Desktape Mounts 4mm Tape on Mac Desktop	$275

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Internal Kit	$769	$839	$1989
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Portable for PC	$869	$1029	$2149

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CD ROM DRIVE TOWERS

Multiple CD ROM drives in a single external enclosure. Great for networks, BBS, or business.

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Toshiba 3401	$639	$1349	$2279
NEC 3X	$699	$1449	$2449
Toshiba 3501	$899	$1849	$3099
Plexstor 4X	$1069	$2199	$3779

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ST-3660A	545Mb, 14ms, IDE, Fast ATA	$299.95
ST-3780A	722Mb, 12ms, IDE, Fast ATA	$389.95
ST-31220A	1.08Gb, 12ms, IDE, Fast ATA	$629.00
ST-5660N	545Mb, 12ms, Fast SCSI-2	$339.95
ST-31200N	1.05Gb, 10ms, Fast SCSI-2	$599.00
ST-12400N	2.1Gb, 10ms, Fast SCSI-2	$1199.00
ST-12550N	2.1Gb, 9ms, Fast SCSI-2	$1359.00
ST-15150N	4.2Gb, 9ms, Fast SCSI-2	$2399.00

428MB DRIVE $209.95 PC World Special!

Note: Please order HD-MHW slot adaptor ($9.95) to mount 3-1/2" drive in 5-1/4" slot.

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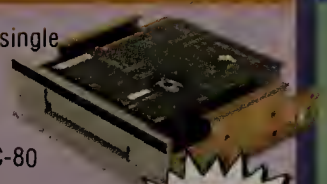

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QIC80-BULK 5 preformatted tapes (250Mb in QIC-80) $99.95

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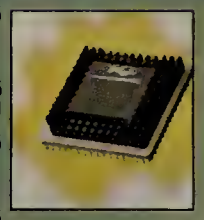

BOXDX2ODP-66 ..... $229.95 Plugs into 33MHz 486SX or 486DX OverDrive socket	
BOXDX2ODPR-66 ..... $229.95 Replaces 33MHz 486SX or 486DX CPU	
BOXDX2ODP-50 ..... $169.95 Plugs into 25MHz 486SX or 486DX OverDrive socket	
BOXDX2ODPR-50 ..... $169.95 Replaces 25MHz 486SX or 486DX CPU	
BOXSX2ODP-50 ..... $119.95 Replaces existing 25MHz 486SX with 50MHz 486SX2	

intel

1280 x 1024 Accelerator

This accelerator card uses Cirrus Logic's chipset to speed your Windows applications.

- 16-bit PC compatible ISA card
- 1Mb DRAM installed
- Supports analog or multisynch monitors

MCT-VGA-5000 ..... $99.95

MCT Network Cards

These Novell approved cards feature a jumperless design, so software can configure the card.

- 16-bit PC compatible ISA card
- NE-2000 compatible adaptor; thin net version includes BNC connector with T-adaptor; 10BaseT version uses RJ45 connector

MCT-10B2 Card with Thin Net BNC connector $49.95

MCT-10BT Card with 10BaseT RJ45 connector $49.95

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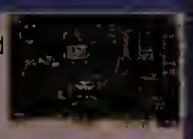
IDE F/H Controllers

Combine your most frequently used I/O ports in one card! This card integrates serial, parallel and game ports with an IDE hard disk interface & floppy controller.



MODULAR CIRCUIT TECHNOLOGY

MCT-IDEIO+	$99.95
MCT-IDEIO Multi-I/O IDE controller	$49.95
MCT-IDEFH IDE Floppy/Hard controller	$29.95
MCT-AIO+ NS16550 Serial I/O card	$89.95
MCT-AMS+ NS16550 4-port Serial I/O card	$129.95

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This MCT modem includes V.42bis and MNP5 data compression plus V.42 error control.

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- 8-bit PC compatible ISA card
- Uses serial port COM1-COM4

$79.95 PC World Special!

MCT-144IF+ $79.95

90MHz PCI Motherboard

This motherboard supports both VESA Local Bus and PCI Local Bus.

- 90MHz Pentium™ processor with 16Kb internal cache memory

$1195 PC World Special!

MCT-M586-90	$1195.00
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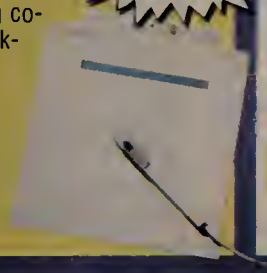
Digitizing Tablet

The Acecat II digitizing tablet features WINTAB compatiblity, allowing co-existence with a mouse or trackball in Windows applications.



- PC compatible tablet
- 5"x5" adjustable active area; 2000 LPI resolution
- Uses serial port COM1-2

$84.95 PC World Special!

ACECAT $84.95

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1MX9-60X3	1M x 9	60ns	SIMM	46.95
4MX9-80X9	4M x 9	80ns	SIMM	184.95
16MX9-70X9	16M x 9	70ns	SIMM	699.00
1MX36-70	1M x 36	70ns	SIMM	159.95
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2MX36-70	2M x 36	70ns	SIMM	379.95
4MX36-70	4M x 36	70ns	SIMM	699.00

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Seagate

FACTORY NEW 1- 5 YEAR WARRANTY

ST3243A	200MB	16MS	3.5"HH	IDE	$159
ST3291A	263MB	16MS	3.5"HH	IDE	164
ST3391A	341MB	13MS	3.5" 1"	IDE	194
ST3491A	420MB	14MS	3.5 1"	IDE	202
ST5660A	545MB	12MS	3 5 1"	IDE	269
ST31220A	1.05GB	9MS	3.5 1"	IDE	539
ST43400N	3.5GB	11MS	5.25"FH	SCSI-2	1850
ST31200N	1.05GB	09MS	3.5 1"	Fast SCSI-2	569
ST11950N	1.68GB	08MS	3.5" HH	Fast SCSI-2	1195
ST12550N	2.14GB	08MS	3.5" HH	Fast SCSI-2	1219
ST11950N	1.6GB	08MS		Fast SCSI-2	1195
ST12400N	2.1GB	09MS		Fast SCSI-2	1099
ST15230N	4 2GB	09MS		Fast SCSI-2	2075
ST15150N	4 2GB	08MS		Fast SCSI-2	2219
ST11900N	1.0GB	09MS	LP3.5"	Fast SCSI-2	1017
ST12400N	2.1GB	09MS	3.5"	Fast SCSI-2	1099
ST410800N	9.0GB	11MMS	FH	Fast SCSI-2	CALL

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• 7200RPM AND 1024K BUFFER MAKES THESE THE FASTEST NON WIDE SCSI DRIVES ON THE MARKET

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ST12550N	2.1GB	08MS	3.5"	Fast SCSI-2	1219
ST15150N	4.2GB	08MS	3.5"	Fast SCSI-2	2219

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FACTORY NEW- 3 YEAR WARRANTY

AC2340	340MB	12MS	3.5X1	IDE	$199
AC2420	425MB	12MS	3.5X1"	IDE	209
AC2540	540MB	11MS	3.5X1"	IDE	255
AC2700	730MB	10MS		IDE	330
AC31000	1083MB	10MS		IDE	485

MICROPOLIS

FACTORY NEW- 5 YEAR WARRANTY

4110A	1.0GB	10MS	3.5'	IDE	$565
2217A	1.75GB	10MS	3.5"	IDE	889
MC4110	1.2GB	9MS	3.5X1"	SCSI-2	565
MC2217	1.75GB	10MS	3.5"	SCSI-2	889
MC1936	3.0GB	11MS	FH	SCSI-2	1639
MC4410	4.1GB	8MS	3.5"	SCSI-2	2275
MC1991	9.0GB	11MS	FH	SCSI-2	3850

THESE DRIVES ARE FINE TUNED FOR AUDIO & VIDEO APPLICATIONS

MC4110AV	1.0GB	8.5MS	SCSI-AV	$639
MC2217AV	1.7GB	10MS	SCSI-AV	979
MC4221AV	2.0GB	8.5MS	SCSI-AV	1469
MC1936AV	3.0GB	11MS	SCSI-AV	1699
MC3243AV	4.3GB	8.5MS	SCSI-AV	2359
MC1991AV	9.1GB	10MS	SCSI-AV	3950

CONNER

FACTORY NEW- 1 YEAR WARRANTY

CFA210A	210MB	14MS	3.5" 1"	IDE	$164
CFA420	420MB	13MS	3.5" 1"	IDE	209
CFA540A	540MB	12MS	3.5" 1"	IDE	269
CP540P	540MB	12MS	3.5" 1"	SCSI	274
CFA810A	810MB	10MS	3.5" 1"	IDE	390
CP1060S	1.0GB	9MS	3.5" 1"	SCSI	549
CP1060W	1.0GB		FAST WIDE	SCSI	519
CFA1080A	1.08GB	10MS	3.5" 1"	IDE	599
CFP2120	2.12GB	10MS	3.5"	SCSI	1250

MicroSolutions

BACKPACK	420MB	PARALLEL PORT INTERFACE	469

Quantum™

FACTORY NEW - 2 YEAR WARRANTY

5 YR WARN. ON P DRIVES/1 YR. WARN. ON 2.5" DRVS.

LPS270	270MB	12MS	3.5X1"	IDE	$185
LPS340A	340MB	12MS	3.5X1"	IDE	209
LPS540A	540MB	12MS	3.5X1"	IDE	265
LPS270S	270MB	12MS	3.5X1"	SCSI	185
LPS340S	340MB	12MS	3.5X1"	SCSI	209
LPS540S	540MB	12MS	3.5X1"	SCSI-2	255
P1080S	1.0GB	9.5MS	3.5X1"	SCSI-2	579
P1440S	1.4GB	9.5MS	3.5"	SCSI-2	745
P2160S	2.1GB	9.5MS	3.5"	SCSI-2	999

digital

FACTORY NEW- 2 FULL WARRANTY

DISK DRIVES FOR POWER USERS

DSP3107	1.08G	9.5MS	3.5"	SCSI-II	$690
DSP3210	2.1GB	9 5MS	3.5"	SCSI-II	1200
DSP5300	3.5GB	12MS	5.25"	SCSI-II	1800
DSP5350	3.5GB	12MS	5.25"	SCSI-II	2200

Maxtor

FACTORY NEW- 2 YEAR WARRANTY

7345	345MB	14MS	3.5"X1"	IDE	$189
MXT540A	540MB	8 5MS		IDE	345
MXT540S	540MB	8.5MS		SCSI	345
7546A	540MB	12MS	3.5"X1"	IDE	255
DR3406	345MB	MOBILE MAX		IDE HHH	250
DR3408	540MB	MOBILE MAX		IDE HHH	295
DR3410	105MB	MOBILE MAX		PCMCIA	360

IBM PS1 PS2

PS/2 50, 50Z, 60, 70, 80, P70, 55SX

125MB	15MS	IDE	$329
200MB	15MS	IDE	349
420MB	13MS	IDE	399
540MB	12MS	IDE	499
540MB	12MS	SCSI	499
1.2GB	12MS	SCSI	799

IBM EXTERNAL SCSI DRIVES/ADD $150

MICROCHANNEL CONTROLLER

IDE	169	SCSI-2	$179

PS/2 INTERNAL DRIVE KITS

30-8086,30-286,25-8086, 25-286

210MB	$299
420MB	399
540MB	499

IBM

364MB	12MS	SCSI	$220
527MB	12MS	SCSI	285
728MB	12MS	SCSI	400
1052MB	8.6MS	SCSI	599
2040MB	9.2MS	SCSI	1140
4250MB	11MS	SCSI	2200
270MB	12MS	IDE	180
364MB	12MS	IDE	189
527MB	12MS	IDE	260
728MB	12MS	IDE	355
1052MB	8.6MS	IDE	570

HEWLETT PACKARD

FACTORY NEW- 5 YEAR WARRANTY

1.0GB	10MS	3.5"	SCSI	$694
2.1GB	8.9MS	3.5"	SCSI	1340

FUJITSU

FACTORY NEW- 5 YEAR WARRANTY

M2684	530MB	13MS	3.5"	IDE	$245
M2694ESA	1.2GB	10MS	3.5"	SCSI	575
M2691	560MB	8.5MS	3.5"	SCSI	CALL
M2903	2.1BG	10.5MS	3.5"	SCSI	CALL
M2915	2.1GB	9MS	3.5"	SCSI	CALL
M2909	3.1GB	10.5MS	3.5	SCSI	CALL

NOTEBOOK HARD DRIVES

TOSHIBA

NOTEBOOK DRIVES/1 YEAR WARRANTY ON 2.5"

MK1522FC	126MB	15MS	2.5"	IDE	$199
MK2224FC	213MB	15MS	2.5"	IDE	275
HDDNB258	258MB	15MS	2.5"	IDE	295
MK2326FC	340MB	15MS	2.5"	IDE	344
MK2428FC	524MB	15MS	2.5"	IDE	524

IBM

IBMHDN250	250MB	IDE	$284
IBMHDN340	340MB	IDE	374
IBMHDN520	520MB	IDE	524

Seagate

ST9145AG	128MB	16MS	$275
ST9150AG	128MB	16MS	CALL
ST9235AG	210MB	16MS	275
ST9385AG	340MB	16MS	395
ST9550AG	455MB	16MS	CALL
ST9655AG	524MB	16MS	CALL

Quantum™

GLS256AT	256MB	16MS	$345
GLS256S	256MB	16MS	349

REMOVABLES/OPTICALS

SYQUEST

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SD5110C	88MB C INTERNAL/EXTERNAL	299
88MB C EXTERNAL W/CART. & CABLES		469
SD3105A 105MB INTERNAL IDE		239
SD3105S 105MB SCSI		319
105MB EXTERNAL W/CART		429
270MB INTERNAL/EXTERNAL FOR PC		455/599
270MB EXT. FOR MACINTOSH		595
270MB CART. SINGLES/5 PACK		86/405
CARTS. 44MB/88MB/105MB		63/95/69
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FUJITSU

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4MB X 9-60NS SIMM	150	256K X 9-60NS SIMM	18	512X36-2MB-70NS	95
1MB X 9-100NS 9 CHIP SIMM	38	1MB X 8-80NS SIMM	40	1X36- 4MB-70NS/60NS	179/189
1MB X 9-80NS 3 CHIP SIMM	39	1MB X 8-70NS SIMM	42	2X36-8MB-70NS/60NS	348/358
1MB X 9-80NS 9 CHIP SIMM	44	4MB X 8-80NS SIMM	135	4X36-16MB-70NS/60NS	595/615
1MB X 9-70NS 3 CHIP SIMM	40	4MB X 8-70NS SIMM	140	8X36-32MB-70NS/60NS	1295/1335
1MB X 9-70NS 9 CHIP SIMM	45	1MB X 9-100NS SIPP	$43	16X36-64MB-70NS/60NS	2395/2435
1MB X 9-60NS 3 CHIP SIMM	42	1MB X 9-80NS SIPP	49	1X32-4MB-70NS/60NS	155/165
1MB X 9-60N5 9 CHIP SIMM	46	1MB X 9-70NS SIPP	50	2X32-8MB-70NS/60NS	310/330
16MB X 9-70NS SIMM	595	1MB X 9-60NS SIPP	51	4X32-16MB-70NS/60NS	560/580
16MB X 9-60NS SIMM	635	256K X 9-100NS SIPP	18	8X32-32MB-70NS/60NS	1195/1235
256K X 9-100NS SIMM	13	256K X 9-80NS SIPP	19	16X32-64MB-70NS/60NS	2295/2335

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16 X 4-20	5.50	64 X 1-15	15.00		

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80486 DX-25	$188	80486 SX/33	80
80486 DX/33	204	PENTIUM 60	800
80486 DX4/100	800	PENTIUM 66	790
80486 DX-2/66	290	PENTIUM 90	850
80486 SX/25	70		

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8087 5MHZ	$40	80287XL 10MHZ	75	80387DX-20 20MHZ	75	83D87DX-10 16MHZ	59	83S87SX20 20MHZ	59
8087-2 8MHZ	139	80287XLT 12MHZ	75	80387DX-25 25MHZ	75	83D87DX-20 20MHZ	59	83S87SX25 25MHZ	59
8087-11DMHZ	89	80387SX-16 16MHZ	75	80387DX-33 33MHZ	75	83D87DX-25 25MHZ	59	82S87XL	59
80287-6 6MHZ	49	80387SX-20 20HZ	75	80487S,X-25	145	3D87DX-33 33MHZ	59	**IIT**	
80287-8 8MHZ	59	80387SX-25 25HZ	75			83D87DX-40 40MHZ	89	2087-8 8MHZ	54

2C87-16 16MHZ	54	3087-33 33MHZ	59				
2087-12 12MHZ	60	3087-40 40MHZ	89				
2087-20 20MHZ	84	3S87SX-10 10MHZ	59				
3087-16 16MHZ	59	3S87SX-20 20MHZ	59				
3087-20 20MHZ	59	3S87SX-25 25MHZ	59				
3087-25 25MHZ	59	3S87SX-33 33MHZ	59				

FLOPPY DRIVES

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1.44MB	$39
1.2MB	49
DUAL FLDPPY 1.44 & 1.2	99

CD ROM BUNDLES

NEC

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3Xi INTERNAL/EXTERNAL	275/375
4X Ext. DUAD SPEED	699

PLEXTOR

33028 INTERNAL	$259
502B INT./EXT. QUAD SPEED	495/545

TOSHIBA

3401B INT./3401E EXT. DBL. SPEED	$249/349
3501 INT./EXT. QUAD SPEED	379/479

CHINON

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WITH SCSI INTERFACE INTERNAL	345
535 DOUBLE SPEED W/SCSI II EXTERNAL	359
WITH SCSI INTERFACE EXTERNAL	415

WIDE SCSI

IBM

0662S12W	1.05GB	8.6MS	LP3.5	$784
0664W	2.04GB	9MS	3.5	1434
0664ESH	4.25GB	11MS	FH	2694

Seagate

ST31200W	1.05GB	9MS	3.5"	$749
ST12550W	2.13GB	8MS	3.5"	CALL
ST15150W	4.29GB	8MS	3.5"	CALL

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CENTRONICS 50 TO MAC 25-PIN	18
CENTRONICS 50 TO CENTRONICS	23
CENTRONICS 50 TO CENTRONICS 50 6FT	23
CENTRONICS 50 TO CENTRONICS 50 3FT	20
CENTRONICS TO OB-50	50
OB-50 TO SCSI-II	50
OB-50 TO DB-50	50
SCSI-II TO SCSI-II	50
FAST WIDE SCSI-II TO CENTRONICS	100

HARD DRIVE INTERNAL CABLES

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SCSI 50-PIN RIBBON 4 CONNS. 3 DEVICE	15
SCSI 50-PIN RIBBON 5 CONNS. 4 DEVICE	18
SCSI 50-PIN RIBBON 8 CONNS. 7 DEVICE	28
IDE 40-PIN RIBBON 3 CONNS.	9
FLOPPY & IDE CABLES SET	11

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TMC-1660SVP SCSI-2 w/Cable & Drivers	$108
TMC-1680SVP SCSI-2/FDD Cable/Drivers	114
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1515	16 BitISA-SCSI 2 KIT	99
1522	16 Bit 7HD/2FD Ki	114
1542CF	8us Master Complete Kit	210
1542C+	8us Mstr. Compl. Kit w/Corel SCSI	314
1570	ISA-SCSI AUDIO KIT	299
2940	PCI-FAST SCSI KIT	294
2742	EISA KIT, 14HDs	314
2742W	FAST WIDE SCSI CARD	354
2842-VL	Fast SCSI-II VESA	239
APA-460	Slim SCSI PCMCIA SCCSI Card	289

BusLogic

KT445S	VESA Local Bus Kit	$299
KT545KT	BusMaster Fast Scsi	229
KTB747AK	EISA Fast SCSI Kit	379
KT757	DEISAWIDE SCSI DIFFERTN.	585
KT757	SEISAWIDE SCSI (SINGLE S)	375
KT946CPCI	Fast SCSI	269

TRANTOR

T130	8-Bit W/SCSI WORKS	$65
T348	Parallel Port to SCSI Plus	149
T358	Parallel Port to SCSI Plus Enhnc	199

DTC

2278VL IOE/FDD/1P/1S/1G	$25
2277VL VL-Bus Caching IDE (Up to 16 MB)	129
2130PC PCI/IDE	29
2280 IDE/FD/1 P/2S/1 G	19
2290 EISA IOE 32-Bit	117
3270VL SCSI-2 VL-BUS FDD/HDD	99
3280AS SCSI-2/4-FDD	99
3290AS EISA SCSI-2/4-FDD	339
6282-24 ESDI 24MBPS	119
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Acculogic

20 PCI SCSI Host Adpt.r, Sup. Wide SCSI-3	$235

Qlogic

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Fast SCSI ISA	149
Fast SCSI VESA Local Bus	199
Fast SCSI PCI	299

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COLORADO MEMORY SYSTEMS

250MB COJUMBO 250	$165
Trakker 250M8 COJT20	323
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2120 CARTS 080 SNG/5PK	21/99

CONNER

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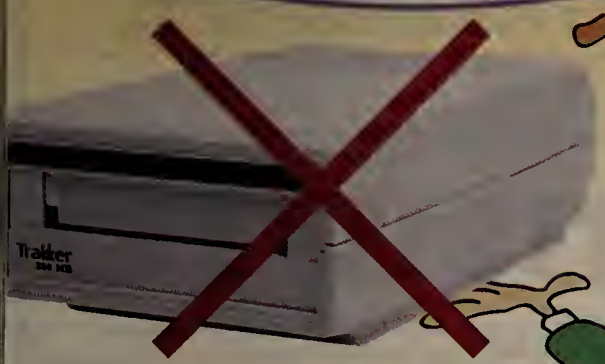

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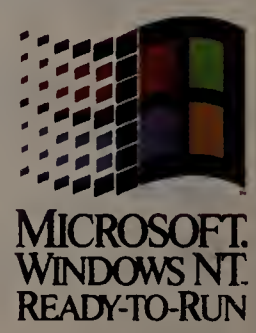

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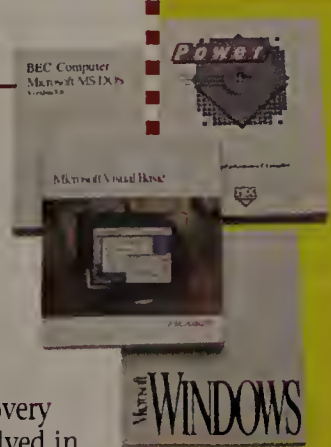

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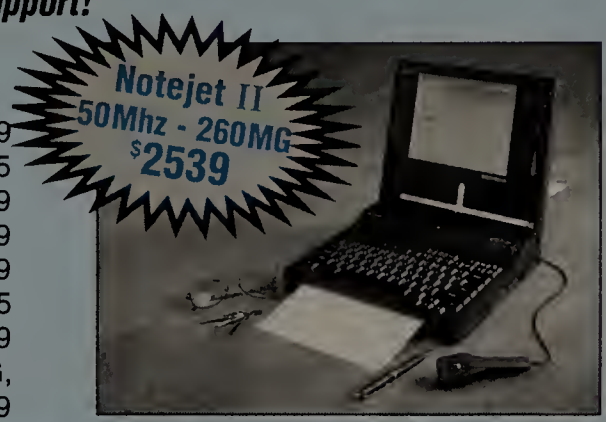

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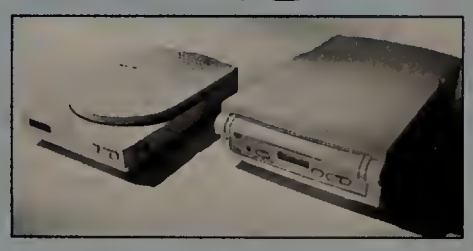

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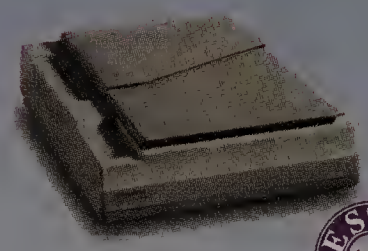

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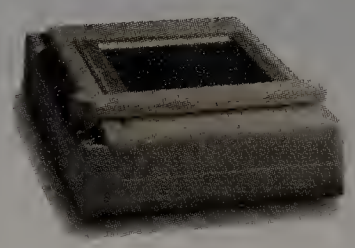

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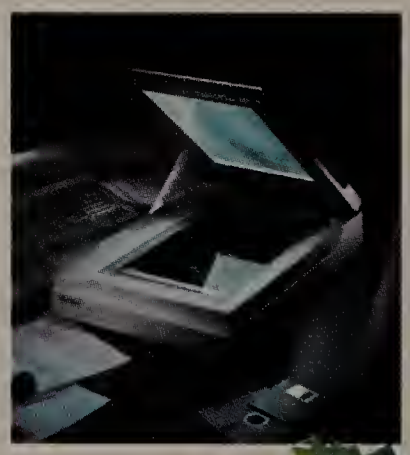

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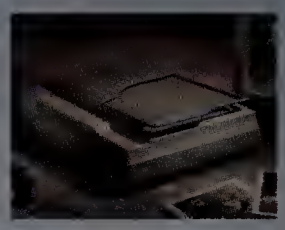

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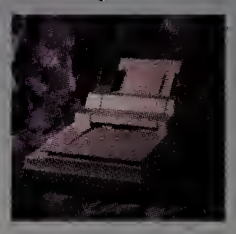

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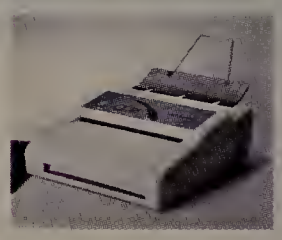

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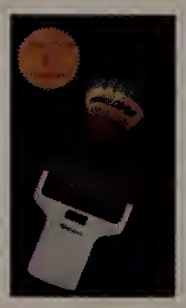

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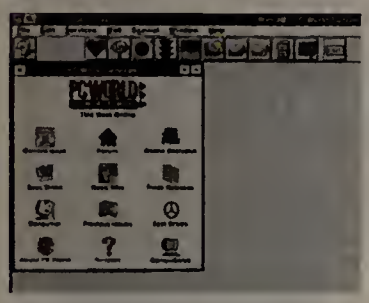

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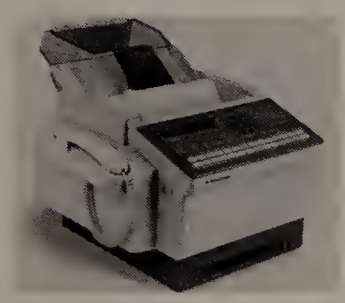

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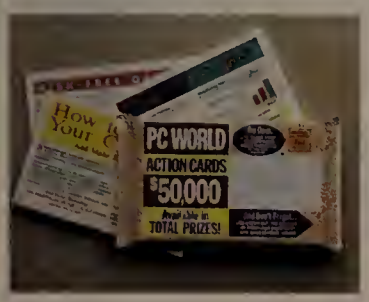

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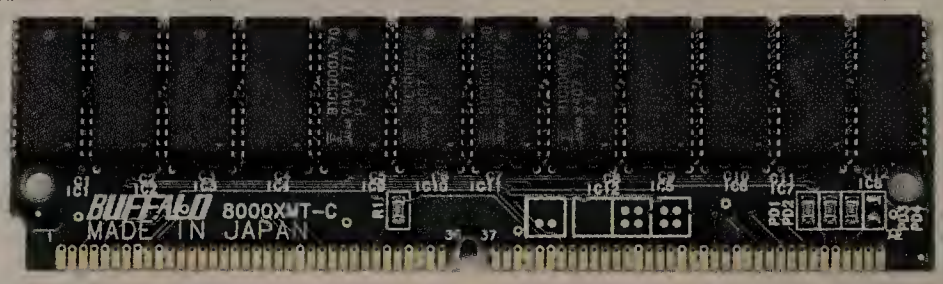

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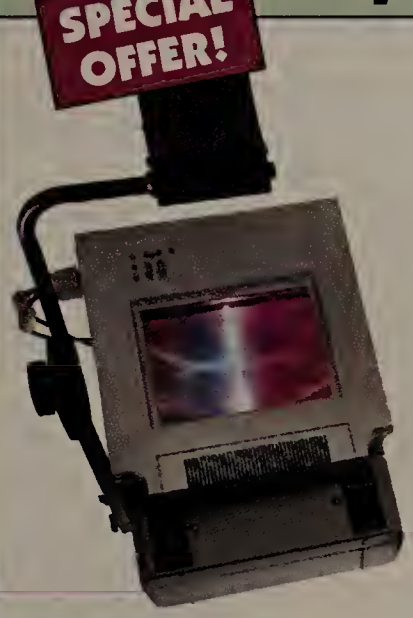

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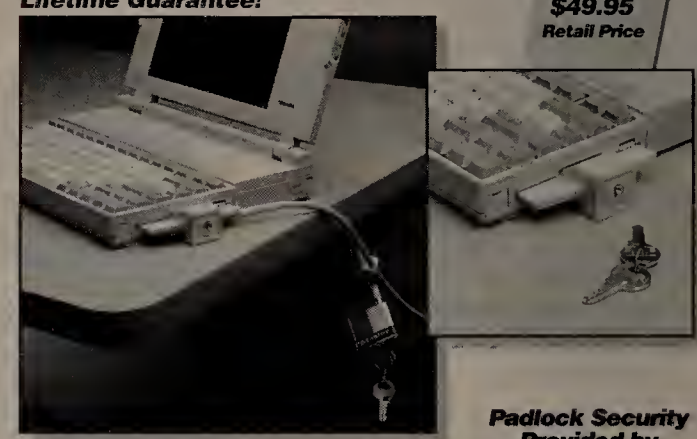

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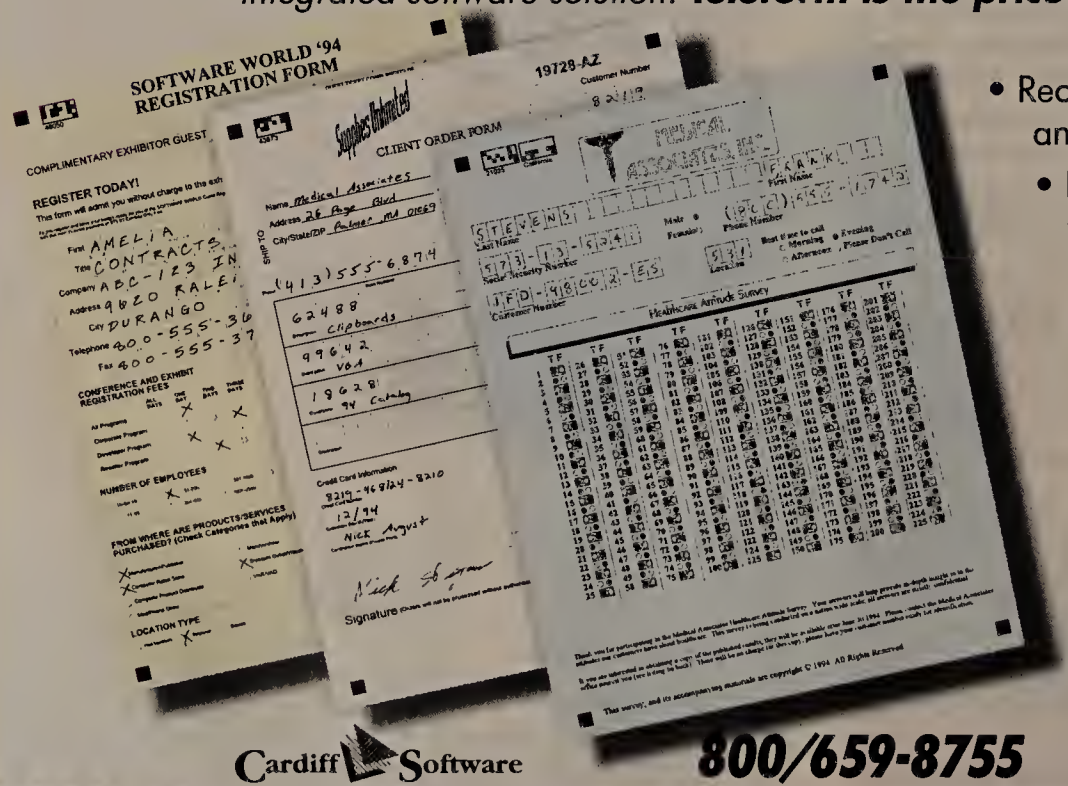

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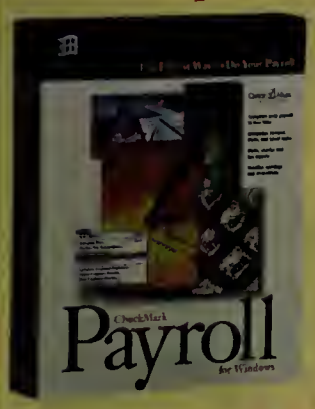

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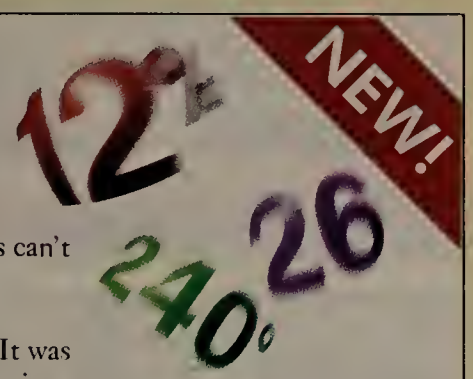

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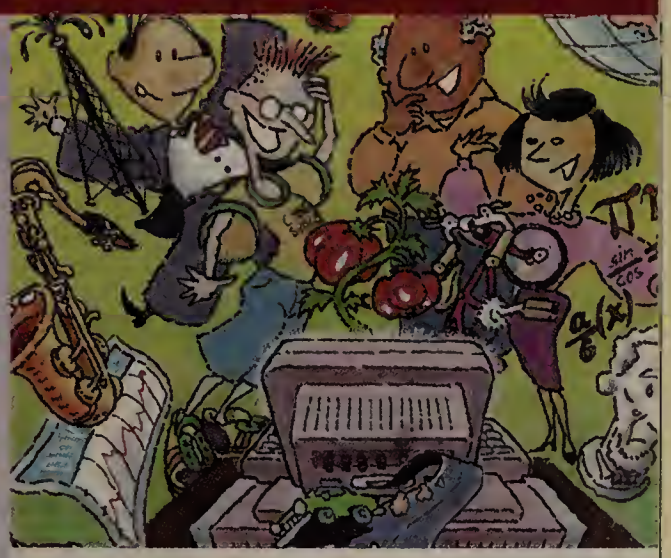

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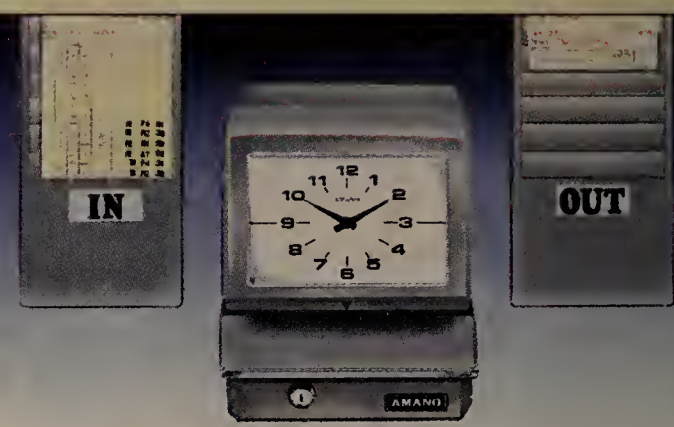

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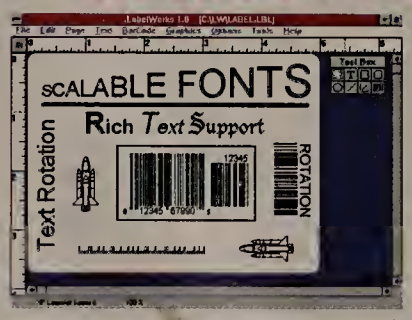

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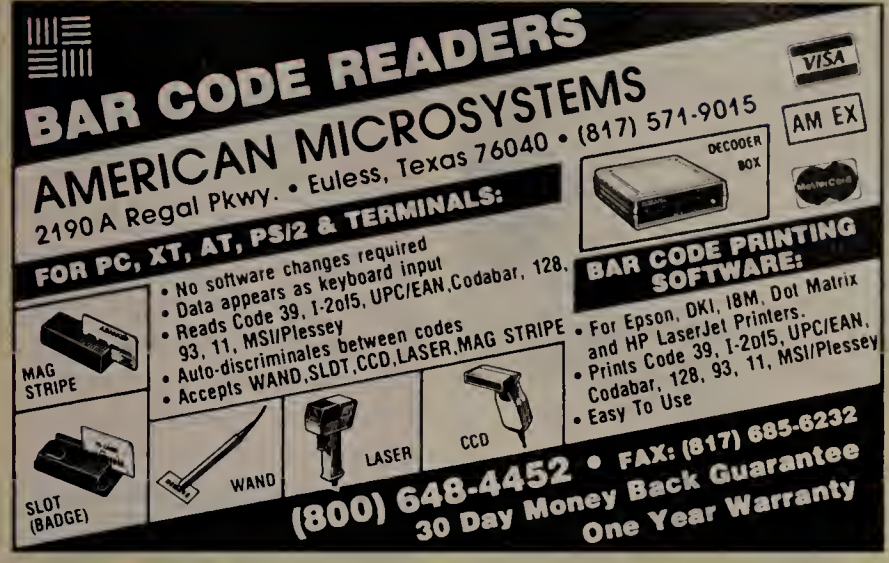

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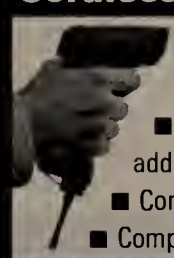

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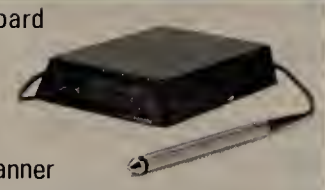

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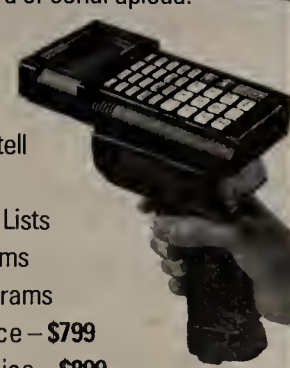

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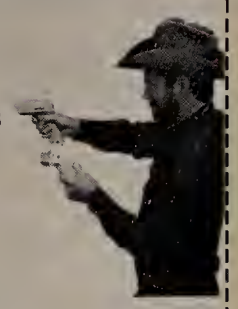

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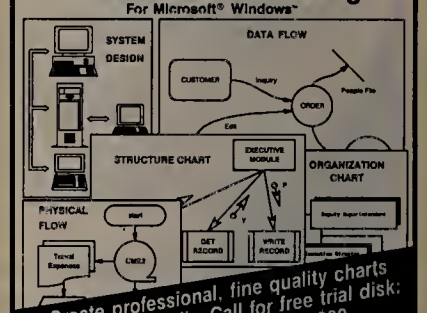

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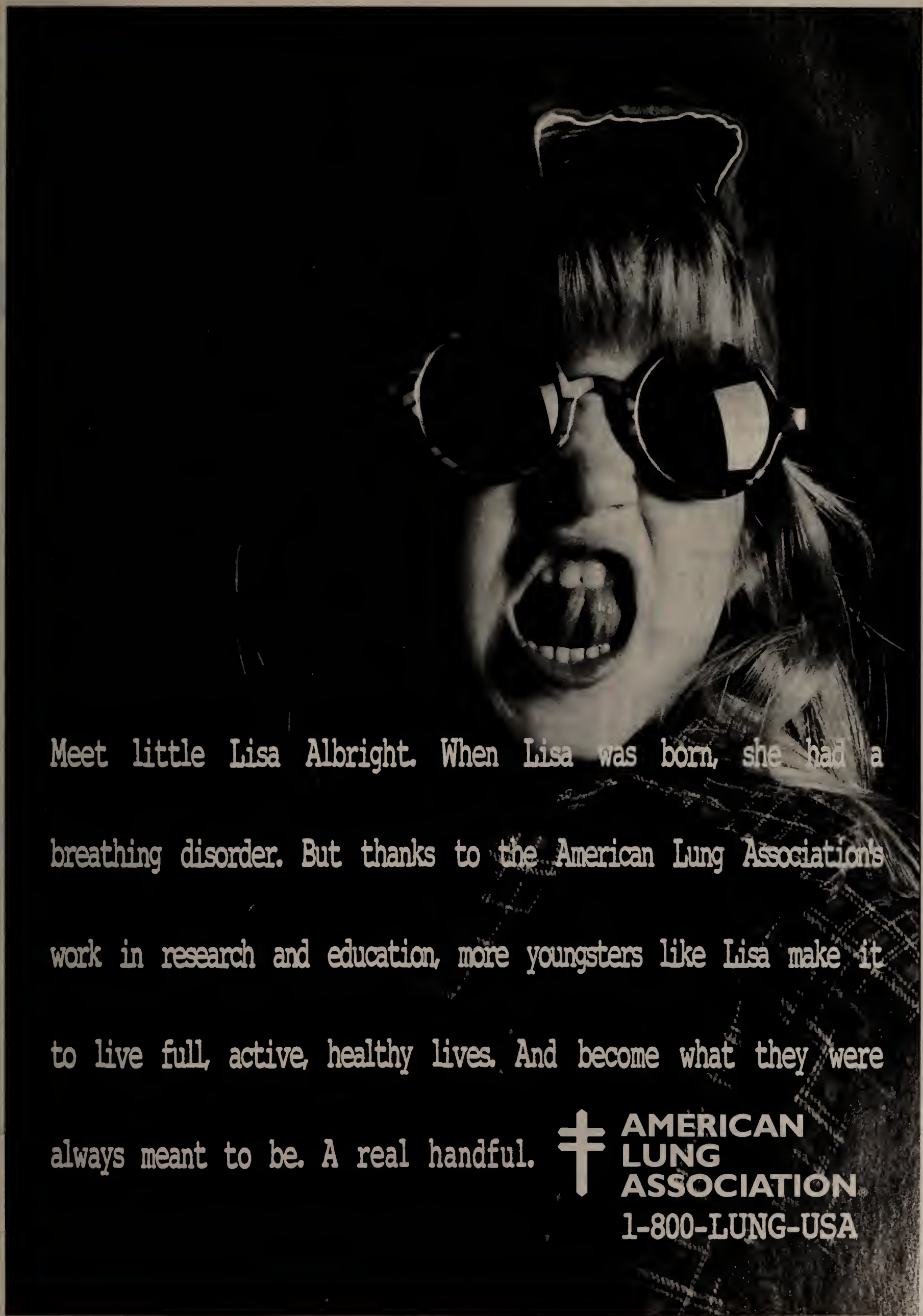
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955 Accounting software
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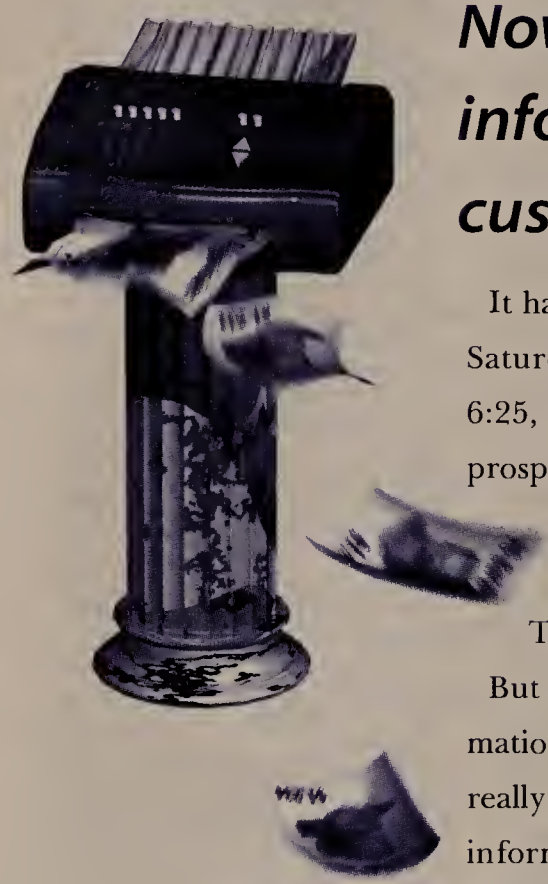

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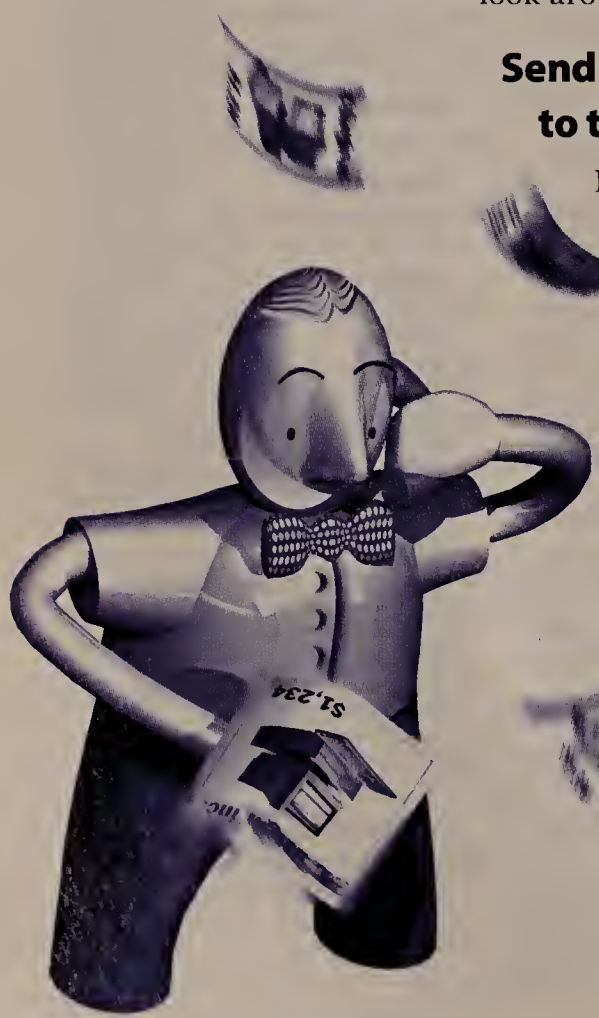

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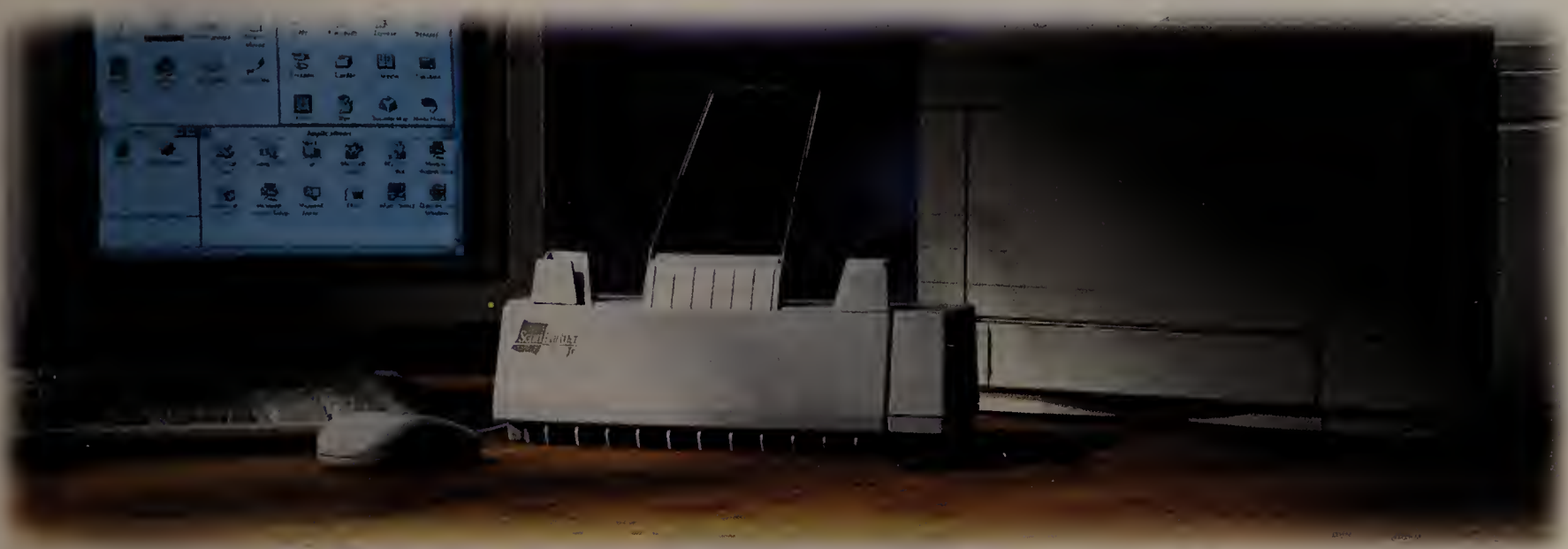

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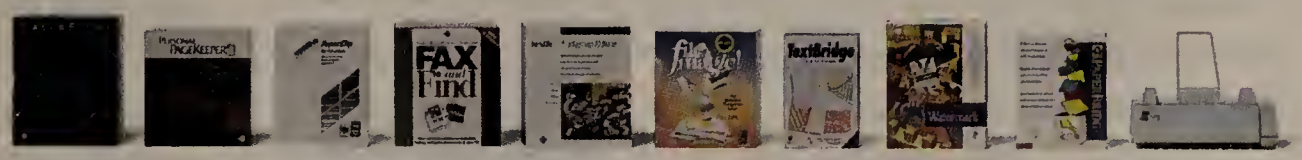

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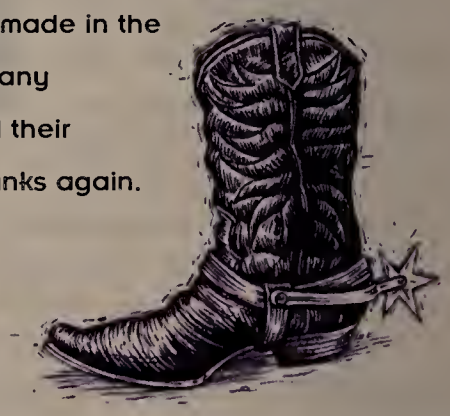

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Atlas Shrugged, a Deadbeat, and a Known Space Odyssey

Computers are really good at some things, but not others. Take atlases, for instance. The point of an atlas is to let you look at maps, and there's just no way your PC can deliver the detail and resolution of the printed version.

Still, some digital atlases are better than others, so I took a look at World Atlas Version 5, the latest Windows-based multimedia atlas by Mindscape. I can't report any major breakthroughs. The maps are still relatively crude and lack essential details. The multimedia components are really beside the point: When you click on a country, a flag rises on a flagpole, a voice pronounces the name of the country, and you hear the national anthem. Big deal. If you choose to view a short video of 1 of 47 cities around the world you'll get to see a few landmarks while a voice solemnly intones, "Excelsior Hotel...Tiger Balm Garden...Victoria Peak Tram..."

Moreover, the multimedia files are slow to load and a bit buggy. The voice-over repeated "Trinidad and Tobago" several times when trying to pronounce it, then the system crashed. The best part of World Atlas is its database of information: statistics on crime, health, education, and economics. But for the same price, you can probably find a printed atlas that's far more useful.

Losing the Beat

Medio Multimedia's World Beat, a Windows CD-ROM that celebrates reggae, soca, salsa, juju, zydeco, and lots more exciting international music, got off to a *very* bad start on my PC: First it forced me to listen to endless Medio commercials during the install routine. Worse, when it couldn't use my perfectly functional MIDI setup, it offered to install an "improved" MIDI driver. Foolishly I agreed. First it trashed my regular driver; then it installed one that didn't work for World Beat or for anything else. So *no* MIDI apps played. Repairing the damage was not a trivial process and took several toll calls to Medio's tech support line.

World Beat's modules include discographies, text, videos, record reviews, MIDI music samples, and selections from scholarly writings on esoteric music. But even when the program was running, problems continued. The modules loaded so slowly I found myself grinding my teeth. The MIDI samples (once they played correctly) still didn't sound much like any music I was familiar with: How can you call something without a banjo *bluegrass?* And while some videos (like an excerpt from *The Blues According to Lightning Hopkins)* played perfectly, others stuttered. It wasn't long before I lost patience—and I suspect you will, too.

World Atlas takes you on a video tour of the Santiago sights, but don't expect highly detailed maps.

Title Wave

Science fiction writers put so much work into crafting their universes that often it's hard for them to resist using the same setting again and again. Larry Niven, one of the best-known science fiction authors, has set a series of novels in Ringworld, part of a twenty-ninth-century universe he calls Known Space. Tsunami, which clearly shares Niven's reluctance to throw away a good locale, has just released its second game set in Known Space: a CD-ROM talkie called Return to Ringworld.

The graphics look like Sunday comics, but Tsunami has spared no expense on its voice talent. The main characters are played by professionals who convey a wide range of emotion and nuance.

The techniques you need to succeed are essentially the same as those you might have employed five or six years ago in text-based adventure games: You scour the area for useful objects and combine them in every way possible until something happens. As a result, despite the credible voice-over dialogue, the great sound effects, and the finely detailed cultural background, Return to Ringworld has an old-fashioned feel. But if you're a fan of the books, or a dedicated gamer, you'll find lots to like in Known Space.

- **Return to Ringworld** $49.95; Tsunami/ Time Warner Interactive; 800/482-3766
  Reader service no. 728
- **World Atlas Version 5 CD-ROM** $59.95, floppy disks $49.95; Mindscape; 800/234-3088
  Reader service no. 729
- **World Beat** $59.95; Medio Multimedia; 800/788-3866
  Reader service no. 730

Michael Goodwin is a contributing editor for PC World. *He can be reached on PC World Online on America Online and CompuServe (see page 12 for information).*

By Michael Goodwin

Gimme That Backup Religion

It was 6 a.m. and the sheriff said we'd better hurry. We had 10 minutes to pack our valuables and clear out: The hillside behind us was a mass of flames, and hot embers were landing on the roof.

What do you grab before running out of the house? Kids? Spouse? Dog? Backup tapes? Well, your loved ones may come first, but your backup tapes should be high on the list. What? You don't have any backup tapes?

If you ever go through what I experienced during the Altadena fire, you'll wish you had. But you don't need a natural disaster to be thankful that you've backed up your system. If an unruly installation program renders Windows unusable, or if you accidentally write over an important file, that backup tape will feel like a lifeline.

And forget about floppies. Copying the contents of a 340MB hard disk onto floppies will give you a repetitive strain injury as surely as will Minesweeper addiction. I know, all you really need to back up is your data; when your drive goes south, you can always reinstall DOS, then Windows, then your apps, then your utilities, then...now how did you have that program configured?

The torture and tedium of backing up to floppies is over. Prices for backup drives are dropping daily, and tape capacity's shooting through the ceiling. In other words, Bub, you've got no excuse.

Drive, I Said

Simple rule: One tape cartridge must hold more data than your hard drive. Otherwise, you can't start your backup and go to bed. I mean, the whole point of using a tape drive is to do *unattended* backups, right? QIC-80 systems used to fill the bill, but as hard disk capacity grows past 250MB, they're looking like antiques. So what should you get?

I had a chance to work with some new Conner TapeStor units, and frankly, I'm sold. Conner's TapeStor 420 holds 210MB of uncompressed files, which translates into a theoretical total of 420MB compressed—how much your files actually compress depends on what's in them. The drive should transfer that 420MB in roughly 45 minutes—and those are minutes you don't have to spend anywhere near your computer. The drive uses Sony's QIC-Wide minicartridges, selling for $15 to $25 each, and can also take traditional QIC-80 tapes for smaller backups. Best of all, the Conner TapeStor 420 costs about $179 discounted, no more than many of the 250MB drives.

Quick Route to Nirvana

The unit connects to your floppy disk controller, saving a slot in your computer. And Conner's installation instructions are clear and easy to follow; if you're at all handy, you can put the backup in yourself. I have hands of clay, and it took me only 30 minutes.

Of course, if you've got a really big hard disk, the 420 won't cut it. In that case, consider the TapeStor 850. It holds a whopping 850MB compressed on QIC-Wide tapes and is a reasonable $349 (it will probably sell for $300 by the time you read this.)

If you read my December column, you know that I don't just own a really big hard disk. I own a humongous hard disk—a SCSI Micropolis 1.7GB drive to be exact. Since my disk has that large a capacity, I considered springing for a digital audio tape (DAT) backup drive; but at a cost of about $1100, that was out of the question. Luckily, I discovered Conner's 4000 SCSI-based backup. It holds 2GB of uncompressed data (that's about 4GB compressed) and flies at 54MB a minute. I can back up a gigabyte in less than 30 minutes! And the Conner 4000 costs only about $600 on the street. If you're a networked small business, this backup is ideal for you.

• *TapeStor 420, 850, 4000; Conner; 800/626-6637, 714/641-1230. Reader service no. 601*

All three of these drives come with Conner's Backup Exec 2.0 for DOS and Windows, a painless program that might look familiar: It's written by the same people who wrote Norton Backup, a dumbed-down version of which comes with MS-DOS 6.*x*. The software's important because, as I write this, neither the Central Point nor the Norton backup products support the Conner drives.

Getting both a DOS and a Windows version is great. I use the Windows program as a rule, but if the day comes that my hard disk crashes, the *last* thing I'll want to do is reinstall DOS, then Windows, then a backup program, and *then* restore my files. With Exec 2.0, all I do is run the DOS program from a floppy and I'm back in business.

By the way, my home, my family, and my hard disk came through the fire okay. My backup tapes are fine too, despite having been clutched in my sweaty palms.

Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. He can be reached on PC World Online (see page 12 for more information).

By Steve Bass

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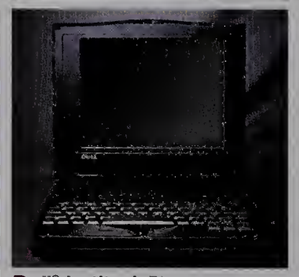

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